FOUNDRY TRADE JOURNAL

EST. 1902

VOL. 106 No. 2207
Registered at the G.P.O. as a Newspaper

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

JANUARY 29, 1959
Offices: John Adam House, John Adam St., London, W.C.2

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Vol. 106. January 29, 1959 No. 2207

Established 1902

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IRON & STEEL TRADES JOURNAL

Single copy 1s.*; by post* 1s. 4d. *Annual subscription: home* 52s.*, abroad* 60s. *(prepaid)*

Editor:
V. C. FAULKNER, F.R.S.A., HON.M.I.B.F.

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Publisher: H. J. DWYER

Circulation Manager: E. T. GRIFFITHS

District Representatives:
G. P. ELLIOTT (Northern Area)

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The FOUNDRY TRADE JOURNAL is the official organ of the British Steel Founders' Association; Association of Bronze & Brass Founders; the Light Metal Founders Association; Foundry Trades' Equipment & Supplies Association; and the National Society of Master Patternmakers.

AN INDUSTRIAL NEWSPAPERS PUBLICATION

Published Every Thursday by Industrial Newspapers, Limited

BARRINGTON HOOPER, C.B.E.
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ADELPHI, LONDON, W.C.2

Telephone: Trafalgar 6171 *(Private Branch Exchange)*
Telegraph Address: "Zacatecas, Rand, London."

PRINCIPAL CONTENTS

PAGE

New Ingot-mould Foundry for Sheffield

Details are given of the new iron foundry and machine shop at the East Hecla Works of Brightside Foundry and Engineering Company 117

Compaction of Sand

By J. Ferdinand Kayser, F.I.M., Assoc. Met.

A thought-provoking article in which doubt is cast on existing theories and new ideas are put forward 121

Carbon-dioxide Process for Moulds and Cores

Review of the present-day position, typical procedures and advantages and disadvantages 125

Production de Lingotiéres dans une nouvelle Fonderie à Sheffield.
Compte-rendu détaillé d'une nouvelle fonderie de fonte et d'un atélier d'usinage de la Compagnie de Fonderie " Brightside " dans leurs usines à East Hecla .. 117

Serrage du Sable. Par J. Ferdinand Kayser, F.I.M., Assoc.Met.
Un article sans détour dans lequel les théories en existance sont mises en doute et de nouvelles idées formulées .. 121

Le Procédé au CO_2 pour les Moules et les Noyaux.
Revue de la position actuelle, grandes lignes des procédés typiques et mémoire de leurs avantages et désavantages .. 125

Eine neue Stahlwerkskokillen-Giesserei in Sheffield.
Es werden Einzelheiten der neuen Eisengiesserei und mechanischen Werkstätte in den East Hecla Werken der Brightside Giesserei-und Maschinenfabriks-Gesellschaft gegeben 117

Sandverdichtung. Von J. Ferdinand Kayser, F.I.M., Assoc.Met.
Ein aufrichtiger Artikel, in welchem bestehende Theorien in Frage gestellt und neue Begriffe formuliert werden . 121

Das Kohlensäureerstarrungsverfahren für Formen und Kerne.
Eine Übersicht über den gegenwärtigen Stand und die typischen Methoden der Praxis, sowie eine Zusammenfassung ihrer Vorund Nachteile 125

Features, News, Commercial Information and Statistics

Leader: Productivity Again 115
International Foundry Congress 116
Forthcoming Events 116
Ideal Home Exhibition 116
Course on Foundry Sands 120
Dinner: IVE Scottish Section 120
American Letter 124
Equipment and Supplies 127
Equipment for Argentina 128
Outlook for British Exports 128
Allied's Window Display Competition 129
Company News 131
News in Brief 132
Personal 134
ISI Translations 136
Raw Material Markets 138
Current Prices of Iron, Steel and Non-ferrous Metals 140

Mechanised Sand Plant
MOULD CONVEYORS
By August's LIMITED

Photograph shows a mould being poured on the August's Mould Conveyor which is part of the large August's Mechanised Sand Plant.

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FOUNDRY
TRADE JOURNAL
Vol. 106 JANUARY 29, 1959 No. 2207

Productivity Again

Productivity is again in the news. When production is down, productivity, that is, rate of production—or production per man/hour or man/year—is not the most popular subject for discussion, but that is precisely the time when competitive considerations demand attention to it. The trade unions have recently been shown "the red light"; at a conference of trade-union executives sponsored by the TUC, Mr. Lewis Wright, chairman of their production committee and indeed a former chairman of the British Productivity Council, told them bluntly that workers in this country were going to find themselves in "a bit of a hole" if the present level of productivity was merely maintained while that of the rest of Europe went on increasing. Redundancy, he suggested, would not be solved by refusing to engage in productivity techniques.

A most striking statement came from a German representative. He told the conference that German workers put up with lower standards of living than their British colleagues because of their experience of the disastrous inflation they suffered in the inter-war years. They practised wage restraint in the national interest and had strengthened their positive attitude towards technological progress and efficiency. (Taking the month of June, 1958, and regarding 1953 as 100, the industrial outputs of Britain, West Germany and France on a comparable basis were 114, 153 and 161.)

The National Institute of Economic and Social Research was founded in 1957 as an independent body to provide businessmen with a comprehensive and systematic account of the economic position and likely future trends, and has Prof. Robinson, professor of economics at the University of Cambridge, as chairman. It has now issued a review which states that there is enough unused industrial plant in Britain to enable the nation to increase its production by 10 to 15 per cent. within the next two years. The review indicates that we are now beginning to emerge from the slight recession, but that the measures taken by the Government (with respect to the "credit squeeze," and so on) will probably raise demand only slightly, possibly to bring it to the 1957 level or a little more. By attracting back to industry those now unemployed, and some of the old people and women who left during the recession, 200,000 or even 400,000 might be added to the labour force. The increase in production could be accomplished without running into shortages of material or labour, without pushing up prices or upsetting the balance of payments, and possibly without increasing the cost of production. Since 1955, the country's stock of industrial plant has risen by between 10 per cent. and 30 per cent. and yet industrial production has scarcely moved. Inflation, redundancy and unemployment can be dealt with by co-operation between management and labour to get higher output and lower costs, with less or at any rate no more effort, through the fullest use of mechanical plant and power. The foundry industry has plenty of room for action in these directions without merely relying on Government measures.

International Foundry Congress

The following provisional programme for the International Foundry Congress, to be held in Madrid from October 4 to 10, has been issued from the headquarters of the *Instituto del Hierro y del Acero* (Spanish Iron and Steel Institute).

Sunday, October 4: Registration of delegates at the Offices of the Institute.

Monday, October 5: Opening ceremony in the morning. In the afternoon various tours around Madrid.

Tuesday, October 6: The morning will be devoted to technical sessions, and in the evening there will be a banquet for official delegates.

Wednesday, October 7: Technical sessions in the morning.

Thursday, October 8: Morning technical sessions, and social event in the evening.

Friday, October 9: Whole-day excursions to surrounding places of interest. Congress banquet in the evening.

Saturday, October 10: Closing ceremony.

The programme for some of the afternoons is to be expanded and details will shortly be made available. The Congress fee is 2,000 pesetas for members, with no extra charge for ladies. It is difficult to estimate the cost in sterling owing to the fluctuation in value of the peseta.

Three post-Congress tours, to include works visits, are scheduled. The first goes north from Madrid to Oviedo, Santander, Bilbao and San Sebastian; the second, eastwards, to Valencia and Barcelona, whilst the third heads south to Granada, Malaga, Cadiz, Sevilla, Cordoba and back to Madrid. The costs of these trips will also be announced shortly.

Forthcoming Events

FEBRUARY 2

Institute of British Foundrymen

Sheffield and district branch:—"Metal Receivers, Tapping Systems and Slag Disposal," by J. W. Grant, 7 p.m., at the College of Commerce and Technology, Pond Street, Sheffield.

FEBRUARY 3

Institution of Chemical Engineers

North-western branch:—"Effluent Disposal and Air Pollution," joint meeting with graduates and students centres, in the Chemical Engineering Building, Manchester College of Science and Technology, Jackson Street, at 3 p.m.

Incorporated Plant Engineers

Edinburgh branch:—"Practice of Thermal Insulation," by Andrew and Angus George, 7 p.m., at 25, Charlotte Square.
Leicester branch:—"Electronic Control in Industry," by A. G. Hickman, 7 p.m., at the Bell Hotel.

Institute of Metals

Oxford local section:—"New Metals: The Rare-earths," by Prof. A. D. McQuillan, B.SC., 7 p.m., at the Cadena Café, Cornmarket Street.

FEBRUARY 4

Association of Bronze & Brass Founders

London area:—Meeting at the Clarendon Restaurant, Hammersmith, commencing 11.45 a.m. with a report and discussion on current activities. Luncheon 1 p.m., and at 2.15 p.m., Mr. Frank Hudsen will present a paper on "Quality in Copper-alloy Castings."

Manchester Metallurgical Society

"Micro-mechanism of Fracture," by Prof. W. S. Owen, PH.D., 6.30 p.m., in the Manchester Room of the Central Library.

FEBRUARY 5

Institute of British Foundrymen

Stoke-on-Trent section:—"Production of Machine-tool Castings," by C. W. Nicholls, 7.30 p.m., in the Stipendiary Court Room, Hanley Town Hall.

Institution of Production Engineers

Reading section:—"Costing and Production-control Methods," by A. E. Garmston, 7.30 p.m., at the Great Western Hotel, Reading.

Institute of Metals

London local section:—"Metallurgical Information," by B. Fullman, B.SC., 6.30 p.m., at 17, Belgrave Square, S.W.1.

FEBRUARY 6

Institute of British Foundrymen

Tees-side branch:—"Moulding Sand—from Mixer to Shake-out," by W. B. Parkes, 7.30 p.m., at the Teesdale Hall, Head Wrightson & Company, Limited, Thornaby-on-Tees

FEBRUARY 7

Institute of British Foundrymen

Lancashire branch:—"Foundry Management," by A. Kirkham, B.SC., 3 p.m., at the Midland Hotel, Manchester.

Ideal Home Exhibition

There is hardly one part of the modern home in which metal in some form or other is not used. This will once again be fully demonstrated at this year's Daily Mail Ideal Home Exhibition which opens at Olympia, London, on March 3. Besides the "big" stuff, like boilers, washing machines, cookers and so on, in which to some extent, products of foundry and enamel shop play a vital part, there will be on show an almost endless array of products, kitchen gadgets, gardening equipment and tools of all kinds, in which metal of all kinds is used. Stainless-steel sinks and sink units, together with other kitchen gear, will be displayed by Leisure Kitchen Equipment, Limited. The "Speediwork" range of plastic and metal domestic aids will be exhibited by the Bearston Metal & Plastics Company. They include fruit and vegetable cutters, waffle-making irons, whisks, and non-sticking siliconized omelette pans. R. G. Bennett & Company, Limited, too, will have a large selection of kitchen equipment on show, including a stainless-steel spatula, openers, mincers, slicers, potato chippers and a big range of wirework. Druce & Company, Limited's, "Tala" display emphasizes the importance of colour in the kitchen, with an extensive array of chippers, cutters, etc. The famous "Jury" range of "glass-on-steel" saucepans, teapots, skillets, etc., will be displayed by Klin Products, who are also showing their new Economy hotplate.

Electric power tools will be on show at the stand of S. N. Bridges, Limited, including a complete home-workshop. New attachments include a two-speed gearbox, multi-purpose saw table, sprayer and cement mixer. Wolf Electric Tools, Limited, will also exhibit their power equipment, and a new range of attachments for use in the workshop, garden, and garage. Still more electric tools will be shown by the Coronet Tool Company. A range of "Surform" handtools and replacement blades will be exhibited by Simmonds Aerocessories, Limited, together with a selection of files and the "Craftsman" plane, with its cast-iron body and machined sides. Aluminium-alloy ladders will be among the display of "Diamond" products put on by Drew, Clarke & Company, Limited; and H. C. Slingsby, Limited, will be exhibiting an extensive selection of their trucks, barrows, ladders, etc.

Scholarships in Machine-tool Design

Ten £500 scholarships a year are to be provided under a new scheme of the Machine Tool Trades Association, enabling selected students to take an advanced course in machine-tool design at the Manchester College of Science and Technology. The curriculum, which has been prepared by the college in conjunction with the industry, represents an entirely new course in machine-tool design.

It is intended ultimately to provide a number of further scholarships allowing outstanding students to undertake a year's advanced research.

New Ingot-mould Foundry for Sheffield

Brightside extend their Existing Works at Ecclesfield

Last September the first ingot mould was cast in a new foundry at the Ecclesfield works of Brightside Foundry & Engineering Company, Limited. The new plant, comprising an ironfoundry and machine shop, and covering an area of 50,000 sq. ft., posed a number of civil engineering problems during its construction, as it required new roads and railway sidings. A description of the foundry, together with some illustrations of the equipment which has been installed, is given below. At the official opening of the new foundry last December* about 200 guests attended, and, after a tour of the works, were welcomed at luncheon by Mr. Tom Firth, chairman of the company. Mr. Ambrose Firth, J.P., chairman of Brightside Engineering Holdings, Limited, said that his grandfather had started an ironfoundry in Attercliffe Road, Sheffield, in 1899, and therefore 1959 was the firm's diamond jubilee year. (Construction of the new foundry has taken about 12 months.)

Extensive research, and the most modern equipment, have been combined to build and put into operation the new ingot-mould foundry at the Ecclesfield works of the Brightside Foundry & Engineering Company, Limited. The largest national requirement for ingot moulds is in the steel industry, for the production of ingots for delivery to rolling mills. This new foundry is designed to manufacture a full range of weights and types of ingot mould, from 1 to 15 tons each. When in full operation it will produce sufficient moulds for a steel-ingot output of over 1,000,000 tons per year. Other foundries at the Ecclesfield works produce iron castings of from 1 lb. to 150 tons in weight.

Foundry Building

The foundry building is a multi-bay semi-portal construction of welded steel frames (supplied by Shelton Iron and Steel Company, Limited), and is well lighted, both naturally and artificially. During the construction of the building it was found necessary to divert two streams with a 14-ft. wide culvert, 400 ft. long, and fed by two 42-in. dia. branches. 10,000 tons of excavation work was completed before a similar tonnage of concrete was laid, reinforced by 300 tons of steel. The main weights are carried on 270 tons of piles, each 25 to 30 ft. long.

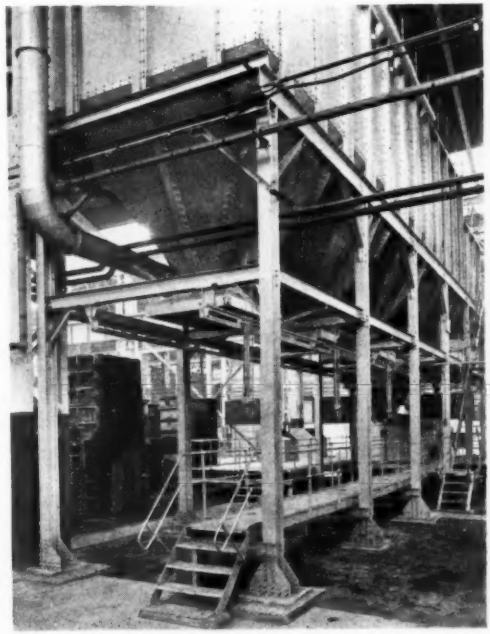
Moulding

Moulding sands, both new and recovered, are fed by conveyor belts to storage hoppers of 250-tons capacity. From these, pre-determined weights are delivered to the sand mixer, and bonding materials added. Before returned sand is conveyed to the hopper (Fig. 1), it passes magnets and screens to remove metal and other foreign matter. The sand is then conveyed, as required, to separate hoppers which serve one 15-ton and two 7-ton jolting machines (by J. W. Jackman & Company, Limited). These machines form the sand into the required shape for the inside and the outside of the ingot mould in one operation, using special patterns. The sand moulds are then finished and dried in oil-fired stoves (Fig. 2).

Furnaces

Hot metal is provided direct by one of two 20-ton per hr. cupolas, or alternatively from a 15-ton capacity oil-fired receiver (Fig. 3). The cupolas are 90 ft. high and are charged with coke, pig-iron,

FIG. 1.—*Overhead storage hoppers of the sand plant at Brightside Foundry & Engineering's new ingot-mould foundry (sand plant was supplied by August's, Limited).*



* See JOURNAL, December 11, 1958, page 708.

FIG. 2.—*General view of the moulding bay, with drying stoves (supplied by Modern Furnaces & Stoves, Limited), along the right-hand side.*

scrap and limestone by an 80-ft. span overhead-travel crane, using specially constructed 3-ton capacity skips. Wet dust- and spark-arresters are fitted to the cupolas, and include a wet slag-granulating system. In addition to nine overhead-travel cranes of up to 15-ton capacity (the cranes in the new foundry were supplied by John Smith (Keighley), Limited, and S. H. Heywood, Limited), electrically-operated cars are also available for transferring ladles of molten iron between bays. During manufacture, strict laboratory control is exercised over sand and metal, and all the processes and equipment incorporate automatic control, or a high degree of mechanization.

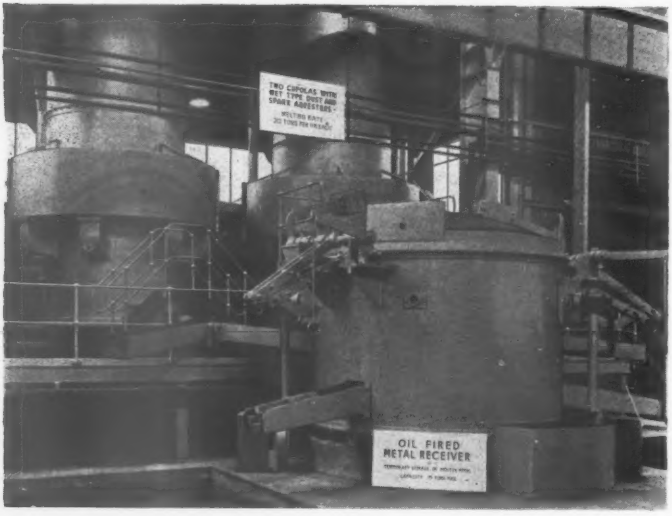


FIG. 3.—*Cupola melting plant, and oil-fired receiver of 15-tons capacity (all supplied by the Incandescent Heat Company, Limited).*

Knockout and Cleaning

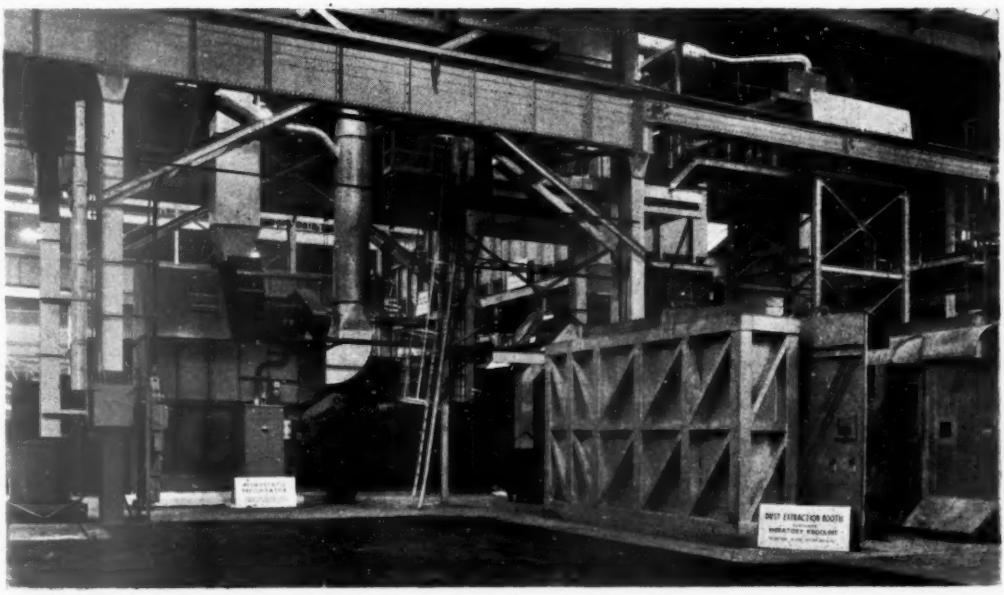
After casting, and allowing a pre-determined cooling time (Fig. 4), the ingot moulds are stripped and placed on a vibratory shake-out in a dust-extraction booth (Fig. 5), which removes outside sand. The cores are then removed and the moulds thoroughly cleaned in the Hydroblast (made by Pneulec, Limited), using a water jet at a pressure of over 2,200 lb. per sq. in. The final process of removing runners, risers and metal flashes is followed by inspection, before despatch to the customer.

Services

A new 11,000-v. high-tension electricity supply has been provided, with a 1,000 kva transformer All main-service water is pumped from wells on the site to a high-level tank over the sub-station. Extensive pipe-work for oil, gas, air and water for all requirements are a feature of the layout. Working conditions have been given great attention throughout, and the latest available equipment to control dust, grit, sparks and smoke has been included in the plant, together with specially arranged natural lighting and highly efficient artificial lighting. The dust-extraction equipment, and pipework, was made by Brightside Heating and Engineering Company, Limited.

FIG. 4.—*Melting and casting bay at the works of Brightside Foundry & Engineering Company, Limited; in the foreground a number of cast ingot-moulds are shown cooling before being stripped.*

FIG. 5.—*Hydrostatic precipitator (left), and vibratory knock-out (made by Coleman-Wallwork Company, Limited). The latter is totally enclosed in a 12 by 10 ft. dust-extraction booth, supplied by Partridge Davies & Company, Limited, which deals with 20,000 cub. ft. per min. of dust-laden air.*



Course on Foundry Sands

Borough Polytechnic, London, S.E.1, have announced details of a course of six lectures, on "Foundry Sands," which will be given by a panel of specialists, commencing Tuesday, February 24, at 7 p.m. The lectures are intended for metallurgists, foundry technologists, production engineers and mechanical design engineers who wish to familiarize themselves with these aspects of modern foundry technology. Additional periods will be arranged for those who wish to undertake organized laboratory work in sand testing under the guidance of the Polytechnic staff. Particulars of the laboratory work will be made available at the first lecture. The fee for the course of six lectures is ten shillings with an additional fee of ten shillings for those wishing to do laboratory work.

Syllabus

February 24 and March 3. "The Constitution and Characteristics of Sand Grains and the Clay Bond," by Dr. J. E. Garside. These lectures cover geological occurrence of sands and clays: effects of weathering; mineralogy and classification of sands; the clay minerals, and the structure and characteristics of sand grains.

March 10. "The Condition of the Mould Face During Casting," by D. F. McVittie, M.A., PH.D. (assistant research manager, Hadfields Limited, Sheffield), dealing with preparation of mould surface, and mould washes; physical and chemical reactions occurring during and after filling the mould, and casting defects arising from faulty mould preparation.

March 17. "The Testing of Foundry Sands," by W. B. Parkes (British Cast Iron Research Association). The following subjects are considered: determination of compression strength at atmospheric and elevated temperatures; tensile strength and shear strength, and mould surface characteristics—permeability, thermal conductivity, durability, moisture content, and refractoriness.

April 7. "Foundry Sand Control," by a Tipper, M.SC., F.I.M. (Harborough, Construction Company), considers routine sand control; use of control graphs; sand cooling and storage; sand reclamation, and sand re-bonding.

April 14. "The Selection of Foundry Sands and Bonding Materials," by D. V. Atterton, M.A., PH.D. (technical director, Foundry Services International, Limited, Birmingham). This lecture is a discussion of the factors involved in the selection of sands and bonding materials, in relation to moulding properties and their behaviour in the mould during and after casting.

Additional periods for laboratory work will be held on April 21 and 28, and May 5 and 12 commencing 7 p.m.

Dinner

IVE SCOTTISH SECTION

A company of about 70 attended the third annual dinner of the Scottish section of the Institute of Vitreous Enamellers at Larbert, on January 13. Mr. R. Watters, chairman of the section, was in the chair. The toast to the "Vitreous Enamellers" was proposed by Mr. J. Ferguson, president of the Scottish branch of the Institute of British Foundrymen, and Dr. Niklewski, member of the Council of IVE; Mr. G. Gildawie, president of the Falkirk section of IBF, proposed the toast of the Institute of British Foundrymen. Mr. McIntosh, a member of the committee of IVE, proposed "The Visitors," to which Mr. J. Baily, Vesco Enamels, Limited, replied. The guests included Mr. J. D. Gardom, general secretary, IVE; and Mr. G. R. Buchanan, general secretary of the Scottish section.

Offer for F. Perkins' Share Capital

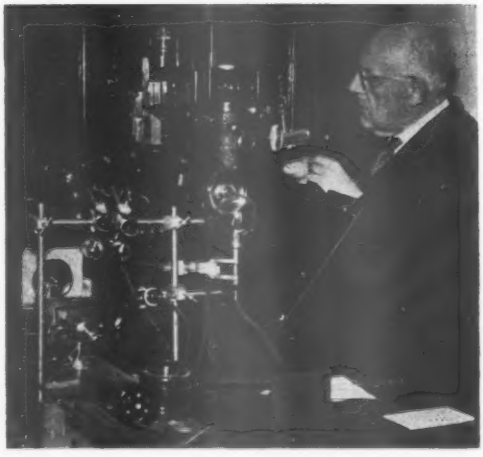
An approach has been made which may lead to an offer for the entire share capital of F. Perkins, Limited, Peterborough, one of the largest diesel-engine manufacturers in Europe. The directors stated on January 19 that negotiations were proceeding and the results would be announced shortly. Talks are being held with Massey-Ferguson, Limited, the North American tractor group.

Perkins's capital is £2,600,000 in 10s. ordinary shares and, at January 16 quotation, the capital is valued at almost £4,000,000. The board recently announced a policy of developing new products and in December it was stated that the company had agreed to issue £325,000 of ordinary shares to the Oliver Corporation of Chicago in return for certain rights to manufacturer outboard motors. The issue then was not expected to be made until June.

Massey-Ferguson has also announced that it was negotiating with the Standard Motor Company, Limited, to acquire Standard's tractor division.

Re-introducing the Author . . .

Mr. J. F. Kayser, the author of the article commencing on the facing page, qualifies for the encomium: "once a foundryman, always a foundryman." Though for many years he has been on the scientific staff of Gillette Industries, Limited, he has a background of practical founding and an undying interest in the subject. He is a member of the IBF and presided over the London branch in 1944/5; he is also a member of the Iron and Steel Institute and a fellow of the Institution of Metallurgists. The research work on which his present article is based was done in his laboratory at home, where the photograph shows him with what is basically a Vickers projection microscope adapted for his study of sands.



Compaction of Sand

By J. Ferdinand Kayser, F.I.M., Assoc. Met.

A theory is sometimes called in which fits certain facts and ideas and thereafter becomes accepted, whereas it may only represent unconnected and inadvertent correlation. The Author examines the packing theory of sand particles in this light and in relation to research into soil mechanics. He concludes that random distribution is much more likely to persist than segregation into size relationships is to occur. Depending on the mode of compaction of a sand, it is concluded that because of the phenomenon of dilatancy, maximum compression need not coincide with minimum permeability.

As delivered to the foundry floor, moulding sand looks like a cohesionless soil. It is, however, a special type of soil in that the individual particles are thinly coated with a binder which may have been present originally. The purpose of the binder is to cement the particles together after the sand has been compacted, but the writer does not propose to deal with the action of binders but to consider the arrangement of sand particles in a finished core or mould.

Amongst the papers on the subject is that of J. J. Sheehan[1], who pointed out that many and complex factors must be taken into consideration, and that a unity of conception must be maintained if trouble is to be avoided in practice.

Sheehan showed that, theoretically, the closest packing of a mass of spheres free to move, or rammed into place in a container having dimensions totalling a multiple of their diameters, is the tetrahedral. Having established the condition of closest

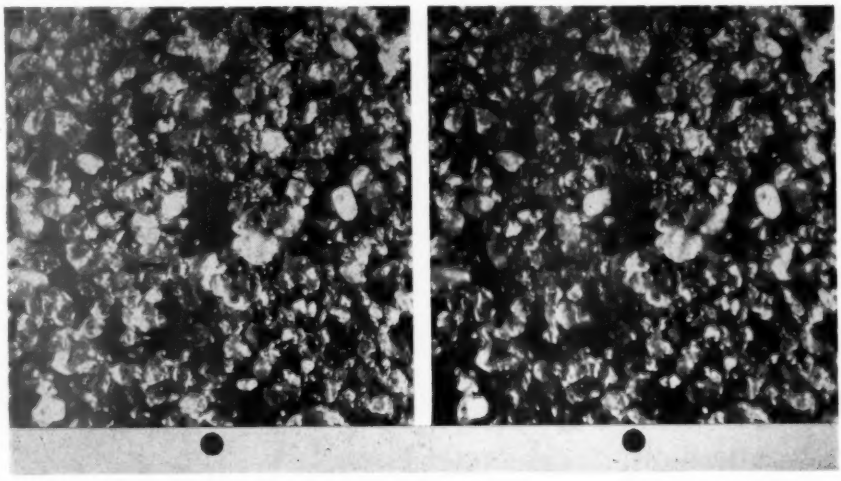


FIG. 1.—*Stereoscopic photomicrographs* (× 16) *of a compacted sand surface, showing typical grotto-like cavities which develop.*

To obtain an impression of stereoscopy and to appreciate depth and roundness of grains, the following method of viewing is recommended: Place a card about 4-in. sq. vertically with an edge along the centreline between the photographs and, at about equal illumination, view them with one eye on the left side and the other on the right, adjusting focus until the two pictures merge into one and thus reveal proper stereoscopy. To aid in focusing, it may help to set the card and eye positions and then first regard the black spots below the pictures so that these merge, transferring attention quickly to the sand.

Preconceived Notions

A great deal has long been known about the shape, size and general properties of sand particles, and probably because many of the grains are more or less rounded, many foundrymen have adopted the packing-of-spheres conception.

packing for grains of unit size, he then calculated the sizes of rounded grains which can fit in the voids between the unit grains. From the results of a number of experiments, Sheehan concluded that although the exact positioning of each particle of sand according to theory is not attained in

Compaction of Sand

practice, it is possible to predict permeability and density of a core from the conception that sand particles pack according to the tetrahedral system when in the condition of closest packing.

His results do not, however, prove that his original conception was true, and it does indeed appear that he had encountered a "nonsense correlation," and that speculations based upon an incorrect assumption about how spherical particles might pack, useful as it may have been in the past, cannot be of any further value.

Microscopic Examination

The literature on sand is enormous, and amongst it there are numerous photomicrographs of sand

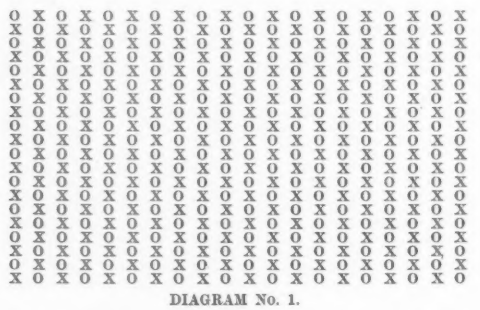


DIAGRAM No. 1.

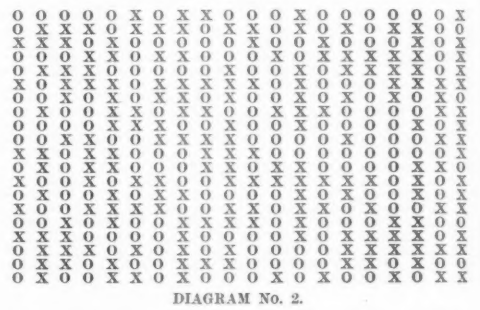


DIAGRAM No. 2.

FIG. 2.—*Representations of a mass of sand consisting of equal numbers of black and white particles. A well-mixed mass is unlikely to assume the distribution shown in diagram* (1), *and most likely to follow the distribution type of diagram* (2).

particles, but as far as the writer knows the structure of sand cores, moulds or soils does not appear to have been studied microscopically. Such examination (see Fig. 1) shows that the particles do not pack as one might expect after reading the literature; they are not orientated as one would expect if there were a tendency to a tetrahedral arrangement, but are randomly distributed. One usually observes two types of voids. The most numerous are more or less triangular or rectangular and their volume is less than that of the average volume of the particles, but one also sees a number of grotto-like voids the volume of which is much larger than that of the largest sand grains present in the mixture. The large voids can be easily seen on the face of a core or on a freshly fractured surface thereof, but it may be argued that they have been caused by grains of sand having fallen out of the surface. One can, however, impregnate a core with Canada balsam or the like, and when it has hardened, polish the surface, when the same random distribution of sand particles and large grotto-like voids can be seen.

Randomness

There are three scources that contribute to the understanding of the compaction of sand into moulds and cores, *viz.*: (1) Past experience; (2) laboratory tests, and (3) a scientific approach based upon a knowledge of all phenomena that have a bearing upon the properties of a mass of discrete particles. A complete scientific approach must hence include chemical, physical and other sciences, but, for the present, the Author proposes to consider only two phenomena, *viz.*: "randomness" and "dilatancy."

It may be assumed that foundry sand is thoroughly mixed and consequently every particle has an equal chance of being in any part of the mass, *i.e.*, the particles are randomly distributed. If a mass of sand consisted of equal numbers of black and white particles it does not, however, follow that the well-mixed mass would, in section, appear as shown in Fig. 2, diagram No. 1; on the contrary it would most likely appear as shown in diagram No. 2, which shows the random distribution of black (X), and white (O), beads as seen through the glass bottom of a box containing a 50/50 mixture of 2,000 equal-size black and white beads. The 2,000 beads were well mixed in a bag and then packed one by one into the box by a blindfolded operator. The box contained 1,000 black and 1,000 white beads arranged in 5 layers, of which the bottom one by chance consisted of 194 black beads and 206 white beads.

If the particles are equal-sized spheres, there is no reason for them to arrange themselves into the theoretically-closest-possible packing by any method of compaction that is used in foundry practice or that can be applied in a laboratory. Still more remote from the realms of possibility is the conception that, if a sand mixture consists of spheres of two sizes that the smaller ones sort themselves out and place themselves in the voids between the large spheres, even if the voids are large enough to accumulate them. Given below is the view of Jones[2], who considered the influence of particle-size and shape upon permeability and wrote:

"If a number of large spheres of equal diameter are arranged in any strictly systematic method of packing, there is a certain diameter ratio (easily calculated) for a smaller sphere which can just pass

between the throats of the large spheres into the interstitial voids. Such a sphere is not so large as one which could be contained in the voids provided it had previous access (as, for example, if it were placed there during packing). The diameter ratio of this sphere is also easily calculated. It might be thought then a simple matter to calculate exactly ranges of particle sizes which, by filling up the voids successively in this way, would give any desired degree of porosity. Since, however, in practice packing must be haphazard and not systematic, this is by no means the case."

Dilatancy

The compressibility of a sand is governed mainly by the extent to which the particles can change position by rolling and sliding. Whilst an increment of load is being applied, there is not a uniform and smooth movement of particles from initial to final positions, but a successive irregular, localized building-up and breaking-down of stress in particle groups. There is a continuous rearrangement of particles and any two particles that are pressed tightly together and are rolling or sliding on each other may undergo a sudden jump in position relative to each other. Finally, when compaction has proceeded so far that the voids are a minimum or nearly a minimum, further increment of load frequently results in a dilation of the voids. This phenomenon was first described in 1885 by Osmond Reynolds, who named it dilatancy. He observed that when a mass of particles, particularly sea sands, were in a position of minimum or nearly minimum voids, any attempt to force the mass to flow disturbed the position of the particles, resulting in a dilation of the voids. Reynolds gave, as an example of a dilatant material, sand in water where the ratio of the ingredients was such that a pressure applied to the material caused it to become dry and harder.

This phenomenon is well known in many industries and to soil engineers, but it appears to be unknown to the majority of foundrymen in spite of the fact that it is so often encountered in sand moulds and cores. In a condition of minimum or near-minimum voids, most of them are triangular and there are few, if any, signs of grotto-like voids. If, however, the mass is subject to shear—and it is difficult to avoid shear during compaction—the number of rectangular voids increases enormously, and if the shear to which the mass is subjected is sufficiently large, many of the voids become grotto-like and considerably larger than the maximum particle size.

In order further to promote the study of the compaction of sands in moulds and the like, there are hence two phenomena that must be kept in mind, *viz*: (1) the random distribution of the sand particles, and (2) dilatancy.

Heretofore it has been assumed that the harder a mould the lower the permeability, although it has been observed that for a given hardness a manually peg-rammed mould is more permeable than a jolted mould, but it does not appear to have been appreciated that, with a suitable choice of method of compaction, one can take advantage of dilatancy and produce a mould of maximum

(*continued at foot of col.* 2)

hardness and resistance to swelling, but with a permeability far removed from the minimum.

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[1] J. J. Sheehan. Coreshop Control. *Proc.* Inst.British Foundrymen, vol. XXXII, 1938-1939 (FOUNDRY TRADE JOURNAL, 60, 516, 552, 575).

[2] W. D. Jones. "Powder Metallurgy," ch. II, p. 19.

New Outlet for Silicon Iron

Bradley & Foster Limited have produced high-silicon iron castings for many years. These have been used mainly in the chemical engineering and allied industries as a combatant of corrosive liquids and gases.

Recently, however, silicon iron has found a new application in the form of anodes for the cathodic protection of shipping. The principles of cathodic protection has been known in the marine industry for many years but its greatest development has occurred in the last ten years. This progress is directly attributed to the realization of the cost of corrosion. Shipping owners have assessed that by the use of cathodic protection a sum in the region of £20,000 per year can be saved on the maintenance of a 25,000 ton ship.

Nature of Corrosion

The nature of corrosion is essentially ionic, similar to the action of a simple cell. It is a well-known fact that any surface which carried a negative charge, *i.e.*, is cathodic, is resistant to corrosion. When corrosion takes place on a metal surface it is due to the formation of a series of ionic cells on the surface. Each anodic area in contact with the corrosive medium is a focal point for corrosion activity, whilst the cathodic areas remain immune. The object of cathodic protection, therefore, is to render all of the metal surface cathodic. In the shipping industry this is achieved by immersing an anode into the sea water and passing a small protective current between it and the ship. The ship is thus rendered cathodic with an associated resistance to corrosion.

In the past these anodes have been made from magnesium. In this case an external electrical supply is not necessary as a simple cell is automatically set up between the anode and the metal surface. It is only recently that silicon-iron anodes have been put into use for cathodic protection, the main reason being the much lower cost and slower rate of corrosion of silicon iron than that of magnesium.

Latest Foundry Statistics

Copper-base Castings. In November, 1958, the output of copper-base castings was slightly above the year's monthly average. The *Bulletin* of the British Bureau of Non-Ferrous Metals Statistics reports the November production as 6,315 tons and the total for the first 11 months as 67,318 tons. This compares with 70,697 tons for the corresponding period of 1957.

Ironfounding: The Council of Ironfoundry Associations states that during the week ending November 29, 1958, there were 126,858 people engaged in ironfounding of whom 118,379 were males and 8,479 females. The figure was 289 fewer than a month earlier.

American Letter

Revival forecast in Automobile Industry

Although American automobile output in 1958 (see Table I), was the lowest for 10 years a revival is forecast, and the industry plan to build about 600,000 cars in January 1959. Last year Harold H. Curtice, president of General Motors Corporation, estimated that approximately 5,500,000 passenger cars would be sold in 1959, and about 8,000,000 in 1965.

TABLE 1.—*American and Canadian Automobile Production Totals for 1957 and 1958.*

	1957.	1958.
America.		
Number of cars	6,115,461	4,244,005
Number of trucks	847,621	650,711
Total	6,963,082	4,894,716
Canada.		
Number of cars	339,987	296 624
Number of trucks	71,261	58,579
Total	411,248	355,303

Nine hundred thousand small cars are expected to be sold in 1959, the total for 1958 being about 600,000, including 377,000 imported cars.

Imports

Germany's Volkswagen company expect their sales boom in the USA and abroad to continue; they are producing 550,000 vehicles a year and expect to increase that total to 650,000 in 1959, and 750,000 in 1960. Americans bought 79,000 Volkswagens in 1957, and the company had expected to sell 90,000 in 1958. Although the greatest demand is for Volkswagen cars, the French Renaults run them a close second. Recent figures showed that Volkswagen had sold 26,000 more units than Renault in America, in the first nine months of 1958.

The 100,000th "Anglia" imported from England was recently delivered by the Ford Motor Company, Limited. Sir Patrick Hennessy, chairman of the company, said that by the end of 1958, they expected to have exported 35,000 vehicles to the United States, which figure would be more than double the 1957 total, and that a further increase was visualized in 1959.

Chrysler Corporation plan to buy "a substantial interest" in the French firm of Simca, the biggest non-government-owned passenger-car builder in France. Simca are the third largest car manufacturer in France and expect to sell 60,000 vehicles to America in 1959. Early in 1958 Peugeot of France also entered the American automobile market, and had planned to sell 8,000 cars there in 1958, the first shipment, of 325 cars, having arrived in April last year.

Wisconsin Regional Foundry Conference

Latest foundry developments in grey-iron, steel, malleable, pattern, and non-ferrous categories will be outlined at the 22nd Wisconsin Regional Foundry Conference, which is to be held from February 12 to 13 in Milwaukee. The following papers are those which will be of chief interest to British readers, and some of them will be dealt with at length in the JOURNAL after the conference:—

"*CentraSteel—A High-modulus Cast Graphitic-steel,*" by W. B. Larson, C. F. Joseph, F. J. Webbere and R. F. Thompson (research staff, General Motors Corporation, Detroit—to be presented by W. B. Larson); "*Steel Castings can be made in Shell,*" panel discussion headed by R. Vinette (Outboard Motors, Incorporated, Milwaukee); "*New Developments in Water-cooled Cupolas,*" by Harold Schwengel (Modern Equipment Company, Port Washington, Wisconsin); "*Latest Pattern Developments,*" by J. E. Olson (Dike-O-Seal, Incorporated, Chicago); "*Improved Trends on Casting Finish,*" by C. A. Sanders (American Colloid Company, Skokie, Illinois); "*Producing Good Ductile Iron,*" by C. K. Donoho (American Cast Iron Pipe Company, Birmingham, Alabama); "*Porosity in Malleable Iron,*" by C. R. Sorenson (National Malleable & Steel Castings Company, Cicero, Illinois); "*Patterns for Malleable and Steel Foundries,*" by J. M. Kriener (Cleveland); "*Making Better Aluminium Castings,*" by D. L. LaVelle (Federated Metals Division, American Smelting & Refining Company, South Plainfield, N.J.); "*Hot Blast for Improved Cupola Operation,*" by D. E. Krause (Gray Iron Research Institute, Columbus, Ohio); "*How to extend Electric-furnace Roof Life and Cut Costs,*" by C. E. Grigsby (General Refractories, Incorporated, Philadelphia); "*Continuous Annealing,*" by L. E. Emery (Marion Malleable Iron Works, Marion, Indiana); "*New Profit Horizons with Plastics,*" by J. B. Ferguson (Allis-Chalmers Manufacturing Company, Milwaukee), and "*Brass and Bronze Foundry Problems,*" by F. L. Riddell (H. Kramer & Company, Chicago).

National Industrial Conference

At the recent National Industrial Conference the board estimated that gross national production would amount to approximately 470 to 480 billion dollars in 1959, compared with the 1958 figure of 450 billion dollars, and that consumer, and wholesale, prices would be reasonably steady. Unemployment is expected to remain above the 1957 level of 5 per cent. throughout 1959, but towards the end of the year the total of unemployed will probably fall from a mid-year level of 4,000,000 (6½ per cent.) to 3,500,000 (5 per cent.).

Highlights of the Proceedings

B. B. SMITH (United States Steel) anticipated that steel production for 1959 would be about 105,000,000 tons, compared with 85,000,000 tons for this year.

M. P. MCNAIR (Harvard University) said that the present rate of recovery was not likely to be maintained, and that a period of stability was approaching.

I. T. ELLIS (DuPont) did not visualize a boom in nondurable goods in 1959, because 1958 had been a very good year.

O. G. SAXON (Yale University) pointed out that there had been a very substantial decline in American export trade, and that there was every indication that 1958 trade would be about 12 to 14 per cent. below that of 1957. An expected improvement in exports for 1959 should, however, bring the level back up to the 1957 standard. He also said that imports would probably increase from 13, to 14, billion dollars in 1959.

J. BACKMAN (New York University) forecast that recovery would continue irregularly throughout 1959, and that prices would show only nominal changes. Wage inflation, however, should be smaller in 1959 than it had been in recent years. American industry was beginning to understand that it must resist excessive wage increases as much as possible.

Mr. J. E. BRYDEN has been appointed home sales manager of Landmaster, Limited, Hucknall, Nottingham, a member of the Firth Cleveland Group. Mr. A. P. MCNEIL-SMITH has been appointed to the sales staff.

Carbon-dioxide Process for Moulds and Cores*

This article is a review of the current position occupied by the Carbon-dioxide Process in the foundry industry. Typical uses of the process are outlined, and a summary of its advantages and disadvantages given.

It is now several years since what is called the Carbon-dioxide Process made its appearance in British foundries. During that period it's progress has been very rapid indeed. The writer has listened to lectures on the subject in which the speaker has almost been lyrical in his praises. He has also listened to discussions in which no two speakers could agree as to the merits of the process, some praising it, some giving it lukewarm support, and some condemning it outright. On the whole, however, it appears to be giving fairly satisfactory results, although obviously there are certain classes of work where it is at present unsuitable. This particularly applies to certain types of cores where easy collapsibility is required.

The process appears to have been widely adopted by the Russians in the early 1950's, but it was not until papers by Atterton[1] and Talbot[2] in 1955, that attention was drawn generally to its potentialities, in this country.

The CO_2 Process consists of mixing any suitable sand with a binder containing sodium-silicate and, after the mould or core has been formed, passing carbon-dioxide gas through the sand, a hardened or rigid mould or core being thereby obtained. Gassing techniques vary somewhat but Talbot's "20 for 20", that is gassing for 20 secs, at a pressure of 20 lb. per sq. in., appears to be representative of general practice. The main thing appears to be to err on the side of undergassing rather than overgassing. In order to assist breakdown, especially in cores, additions of pelleted pitch, graphite, coal-dust or wood-flour, are made to the sand mix, although some operators claim that this is not necessary.

Sands Used

Experience has shown that a wide range of British sands can be used with the process, amongst them being material from Congleton, Redhill, Southport, Leighton Buzzard and Erith. Provided that the clay content is low, and the grain size suitable, the essential requirement is that the sand be clean, dry and free from excessive fines. The type of mixer used does not appear to be critical, the essential thing being to see that the mixing is done well. A typical mixture for cores is as follows:—

100 lb. dry Erith or Redhill sand
4 lb. of binder (containing sodium silicate)
1 lb. of pelleted pitch

for moulds (facing sand):—

100 lb. dry sea sand
5lb. sodium-silicate binder
1 lb. Fulbond or other binder to give green strength
1 lb. of pelleted pitch.

Other sands, can of course, be used, some of which are quite satisfactory with a lower binder content. After mixing, the sand is stored in closed metal containers and any heaps in the foundry should be covered with wet sacks. With proper precautions there does not appear to be any difficulty in keeping mixed sand for several days.

Parramore[3] have given figures for the permeability and compressive strength of CO_2 Process-sand mixtures, and these are set out in Table 1.

Mould Production

Due to the texture of the sand mix, ramming should be carried out with rammers on the blunt side. It is claimed that sand is pushed rather than rammed on to the face of the pattern.

With wooden patterns, a smooth finish is essential otherwise stripping difficulties are likely to be encountered, especially if the moulds are gassed prior to stripping. With large castings using wooden patterns it is preferable to strip before gassing, but with well-finished metal patterns it does not appear to matter at what stage gassing takes place, whether before or after stripping. Various types of moulding machines have been found to be quite suitable for use with the process.

Coremaking

Standard, and existing, coreboxes can be used, but any new coreboxes should be made to very much closer dimensional limits. The adoption of the CO_2 Process has led to a wide use of shell cores with an obvious economy in sand consumption. Due to the fact that hardening is carried out in the corebox there is no danger of hollow cores distorting. It has also been found that the number of core-irons and -grids can be greatly reduced; they can be dispensed with altogether in some cases.

Gassing Moulds or Cores

There are many and varied methods of introducing the CO_2 gas and it is suggested that when a satisfactory method has been found it should be adhered to. One method is to use thick rubber pads with criss-cross channels cut in the face coming into contact with the sand. Another method is the use of hollow patterns and patternplates. For large patterns which are gassed after stripping, the cover method, which consists of a sheet of hardboard or plywood edged with a rubber-covered wooden strip, gives satisfactory results.

Sand Recovery

In the early days, it was the practice to discard all used sand from the CO_2 Process as it was thought that, owing to the sodium-carbonate build-

* Reprinted by courtesy of *Bradley's Magazine.*

Carbon-dioxide Process

up, serious trouble would be encountered. It has been found, however, that at least a proportion of this used sand can be re-used in coremaking, and that a proportion can be added to green-sand systems without causing serious trouble. However, sodium carbonate can be removed by washing with water, and investigations have been carried out by several firms to find an efficient and economical method of doing this.

Advantages and Disadvantages

What are the advantages and disadvantages of the Process? These have been enumerated by various writers and the following is a summary of the views expressed:—

Advantages

(1) No heating is required, and in coremaking and dry-sand moulding this obviously results in a considerable saving of fuel.

(2) Since no drying is required, faults arising from insufficient drying are eliminated.

(3) Heating and cooling of the moulds can cause distortion. In large moulds and cores this was often a serious cause of trouble through crushing, and excessive clearance was the rule to prevent this happening. With the CO_2 Process, this precaution is no longer necessary.

(4) Heating may also cause moulding boxes to distort, so trouble from this source also disappears.

(5) Drying ties up moulding boxes. The CO_2 Process, by eliminating drying, means fewer boxes are needed for the same output.

(6) The type of base sand used for the Process is such that buckling and scabbing are almost eliminated. Such defects of this type as do occur are almost wholly due, it is claimed, to lack of care on the part of the moulder.

(7) Core-irons and -grids are reduced in number and in some cases not needed at all.

(8) With the elimination of the necessity for drying, mould- and core-stoves are no longer necessary. The space occupied by them can be used for other purposes.

(9) Greater simplicity of mould production gives greater latitude to work-study, and increases the amount of unskilled labour that can be used.

TABLE 1.—*Typical Properties of Seaton Carew Sea-sand Mixtures (According to Parramore).*

Sand mixture.	Permeability.		Compression strength, lb. per sq. in.	
	Green.	Dry.	Green.	Dry.
Core sand containing 4 per cent. binder	160–180	160–180	0.9	200
Core sand containing 4 per cent. binder, 1 per cent. wood-flour	160–170	170–190	1.1	150–190
Moulding sand containing 4 per cent. binder, 1 per cent. pelleted pitch and 1 per cent. fullbond ..	170–190	170–190	2.0 to 2.3	170–200

In many of the advantages claimed, the emphasis appears to be upon the elimination of any heating. Whilst this is true of dry-sand moulding and coremaking, it does not apply to green-sand moulding. Any advantage in the latter case must come from greater dimensional accuracy and improved soundness, due to a more-rigid mould, and to the elimination of some of the defects associated with green-sand moulding.

Disadvantages

(1) The Process probably requires greater supervision than hitherto.

(2) Difficulties are met with in stripping, and some trouble is encountered due to "burning-on."

(3) The breakdown of moulds and cores may be difficult. Various additions to assist breakdown have already been quoted, but care should be taken to use only the minimum amount of binder.

(4) Difficulty is found in re-using sand already impregnated with sodium carbonate. Up to the present most reclamation processes cost more than new sand.

In weighing up the advantages and disadvantages it must be remembered that the Process is still in its infancy. Experience will probably "iron-out" many of the disadvantages, whilst time will prove or disprove whether all the advantages are as sound as they are claimed to be.

REFERENCES

1 "Carbon-dioxide Process," by D. V. Atterton, M.A., PH.D., FOUNDRY TRADE JOURNAL, 98, page 432.
2 "Cores and Moulds by the CO_2 Process," by A. Talbot, FOUNDRY TRADE JOURNAL, 98, page 559.
3 "The Carbon-dioxide Process of Mould and Core Production," by G. E. Parramore, A.I.M., FOUNDRY TRADE JOURNAL, 102, page 325.

British Firms in New Zealand Steel Project

A steelworks based on scrap and a rolling mill plant is to be established in New Zealand by Colvilles, Limited, and Stewarts and Lloyds, Limited, in conjunction with one of the Dominion's largest users of steel, Fletcher Holdings, and a large processor of scrap, Industrial Metals, together with a number of other New Zealand companies. Consultants are to be engaged and detailed plans will be drawn up.

In October the New Zealand Government approved plans by Fletcher Holdings and Industrial Metals to establish a merchant-bar mill to make steel products from scrap metal, and it was expected at the time that British and overseas concerns would actively participate in the project. The total cost of the mill was expected to be in the region of £2,500,000 and a total annual output of 40,000 to 50,000 tons of steel products such as reinforcing steel rods, flats, and rounds was envisaged. In all some £2,000,000 worth of steel would be produced annually.

At present New Zealand imports some 350,000 tons of steel and 7,500 tons of pig-iron a year.

INCORPORATED PLANT ENGINEERS, 2, Grosvenor Gardens, London, S.W.1, has changed its name to the Institution of Plant Engineers.

Equipment and Supplies

Power-operated Roofing Shutters

Templewood Hawksley Limited, Slough, Bucks (a member of the Hawker-Siddeley group), are now marketing power-operated roof-ventilating shutters: These are of the type which replace normal glazing in pitched industrial roofs, and open outwards in batteries to give a view of the sky through large areas, while still remaining weatherproof in almost all conditions. The shutter vanes are constructed of aluminium troughed sheeting, or standard 3-in. pitch corrugated galvanized steel sheets, and can be adjusted at any angle to a maximum of 65 degrees to the plane of the roof. A 1-h.p. geared motor, enclosed in a dust- and water-tight housing, provides the power for operating the shutters. In the event of a power failure it is possible to close the shutters by hand. They are quickly and easily installed and maintenance is required only two or three times a year, according to working conditions. Templewood Hawksley also manufacture stack ventilators, and a design of continuous ridge-ventilation; ultimately, production of a range of fan-assisted ventilators, etc., is envisaged.

Mould Seal

With the wide use in foundries of the CO_2 Process for making sand moulds, coupled with the now rapidly-growing use of epoxy-resin patterns and coreboxes, it would seem logical to use CO_2 sand moulds for casting the patterns, etc., in place of the currently-used plaster moulds.

The fact that CO_2-bonded sand moulds have not so far been used on a commercial scale for casting epoxy-resin patterns is probably due to the difficulty of providing an effective seal to prevent penetration of the resin into the mould face. However, recent development work by Leicester. Lovell & Company, Limited, of North Baddesley, Southampton, has provided a solution to the problem in the form of a sealing material applied by brushing on to the mould surface, and, using a suitable sand, CO_2 moulds have been made and effectively sealed in this way to produce satisfactory patterns. The number of coats of sealing material (known as Epophen Mould Seal) required depends on the sand selected for the mould, but usually two coats are sufficient with a fine-grain sand. A fine hair brush is used for applying the material, five minutes being allowed between coats.

Drum-lifting Device

A modified version of the VLL/10 drum-lifting device, incorporating a "pre-loading" safety mechanism, is announced by British Electrical Repairs, Limited, 10 Charlotte Street, Manchester 1. It is designed to handle drums of any type, size and weight, according to requirements. "Pre-loading"—the application of adequate clamping pressure before the drum leaves the floor—eliminates the danger of load-slip. Movement of a hand lever sets the clamps in the "pre-loading" position and, as the drum is lifted, clamping pressure is further increased by the supporting-lever linkage mechanism. Steel-backed bronze bearings are incorporated in the device and can be lubricated with a grease gun.

A power-operated model is available, equipped with fully-automatic or remote electrical control, and a range of manual- and power-operated devices, for lifting and rotating drums through 360 degrees, have also been developed by this firm.

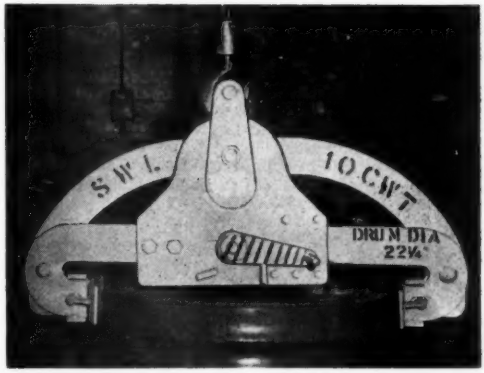

FIG. 1.—*Drum-lifting device developed by British Electrical Repairs, Limited, of Manchester.*

Short-range Photography of Castings

Kodak, Limited, Kingsway, London, have introduced the "Kodak" technical close-up kit, which provides a simple means of taking close-up colour pictures by flash, at a camera-to-subject distance of 7 in. A possible use of the apparatus is short-range photography of castings, and casting defects. At a range of 3½ ft., a marker on the close-up frame is used to correct for parallax, and time is saved in taking pictures at about 7 ft. because there is no need to remove the close-up frame from the camera. It is claimed the kit can be used even by a photographically inexperienced person. It consists of a close-up frame (L-shaped field-frame, two supporting rods and camera bracket); "Portra" lens in "Kodisk" mount, "lumenized" to give maximum light-transmission; flasholder with camera bracket and cable; flash cover, of soft plastic material, which fits over the flasholder, and an instructional manual. This kit can be supplied complete with the firm's Bantam camera.

Turret-jaw Vice

The DOHM group of companies, 167 Victoria Street, London, S.W.1, have introduced a turret-jaw vice, which is claimed to solve many of the difficulties encountered when using ordinary fixed-jaw vices. The new vice has a pivoted turret jaw, which contains a series of vertical, half-round, and V-slots to hold angles, tubes and bars of various shapes and sizes. Horizontal work, such as tubes, is held in a long V-groove across the face of the turret jaw, without end droop, and irregularly-shaped work may be securely held, without clamps or jigs, by adjusting the jaw to achieve a multi-point contact. Undue stress and strain on the work, or the vice, is avoided, since all work is held across the centre of the vice, without interference from the actuating screw. The vice is precision-made, with a case-hardened black-heart malleable cast body of 20-tons per sq. in. tensile strength.

J. W. & C. J. PHILLIPS, LIMITED, Pomeroy Street, New Cross, London, S.E.14, are now manufacturing nylon dowel-plates, designed to replace those previously made in die-cast zinc alloys, and as brass stampings. Amongst properties claimed for the plates are high tensile strength, great heat stability, and resistance to most solvents.

Equipment for Argentina

Delivery has just begun of more than half a million pounds' worth of annealing equipment for the new steelworks of Sociedad Mixta Siderurgia Argentina (SOMISA) at San Nicholàs, near Rosario, Argentina. All the furnaces for the large annealing shop, which will anneal more than 300,000 tons of steel per year, are being supplied by the Incandescent Heat Company Limited, Smethwick, as packaged units, completely

assembled in England and shipped ready for immediate operation in Argentina. Part of the first convoy of equipment is shown being delivered by lorry at the British Transport Commission's docks at Newport, Mon. It is ready for loading into the Thorpe Grange, owned by the shippers, Houlder Brothers & Company, Limited. All the equipment ordered will pass through Newport Docks, and delivery will be complete by the middle of this year.

Outlook for British Exports

The January 1959 issue of the G.E.C. *Export Guide* (issued by the Economic and Marketing Research Unit of the General Electric Company, Limited, Magnet House, Kingsway, London, W.C.2), shows a continuing deterioration in some of the United Kingdom's best overseas markets. Some countries, however, continue to present the favourable opportunities for British exporters, while a few others offer further improved potentialities. The *Guide* provides the latest available information in this country on the export prospects for 36 major groups of manufactured goods in Britain's major export markets, together with an indication of current economic and commercial conditions in these countries.

Current prospects are "good" in nine countries, "improving" in six, "deteriorating" in 10 and "bad" in nine. This is the least-promising international trading situation reported since October 1956. The effect of the advent of the Common Market is commented on. Changes in trading opportunities for British exporters since October 1958 have become worse in eight countries—Australia, Denmark, Finland, Italy, Netherlands, Pakistan, Spain and South Africa. Only in Ceylon are there signs of an improvement.

Scots Foundrymen warned

Members of the Amalgamated Union of Foundry Workers held a meeting in Glasgow recently, to protest against redundancy in Scotland. One of the speakers was Mr. George Middleton, general secretary of the Scottish TUC, who said that Scotland would have to exert every effort, both political and economical, if the Scottish worker was to have an equal opportunity with workmen in other parts of the country. The backward industrial state in Scotland was leading to a very serious position for the workers. He went on to say that one of the reasons for higher unemployment in Scotland was the lack of consumer goods industries, and to help remedy this the Government should provide more investment for industries in Scotland and set up advanced factories for industrialists. Mr. Thomas Graham, general secretary of the AUFW, said that by the end of this year, there would be a reduction nationally of between 11,000 and 12,000 foundry workers. In Scotland last year the reduction was 1,840, which represented 11.9 per cent. of the labour force.

Mr. Robert Garland, national organizer of the Union, said: "Loss of work for us affects the whole engineering industry if nothing is done. We believe that a Government expansion policy in connection with public works and building could create a demand for foundry products, and a shorter working week could be introduced without reduction of wages to cushion the recession. We don't need to price ourselves out of the market by doing this. We have new production techniques, and these would still keep prices competitive."

The meeting passed a resolution expressing grave concern at the general increase in unemployment in Scotland and, in particular, in the foundry industry. Members urged that prior consultation should take place between employers and unions before dismissals were made, and called on the Scottish TUC and the Scottish Board for Industry to press the Government to bring more work to Scotland.

Closure of Oldham Foundry

Platt Brothers & Company, Limited, of Oldham, textile-machinery manufacturers, are to close the foundry at Hartford Works, Oldham, with a view to transferring the work to the more modern foundries of Dobson & Barlow, Limited, Bolton, and Howard & Bullough (Foundries), Limited, Barton. The three companies are all members of the Textile Machinery Manufacturers, Limited, group.

The Barton foundry was formerly operated by Platts (Barton), Limited, which closed down two years ago, but the foundry was taken over by Howard & Bullough as part of their own reorganization programme. Operations at the Hartford foundry have been gradually reducing over the past year since work was first transferred to Dobson & Barlow. It is expected that about 140 of the 200 employees at the Hartford foundry will become redundant. Discussions are being held with local union leaders to ensure smooth working of the closure. There are also to be discussions about a reduction in the labour force in order that full-time working may be resumed throughout the plant which is at present operating a four-day week.

THE JOURNAL congratulates the Friendly Society of Ironfounders, now integrated with the Amalgamated Union of Foundry Workers, on the attainment of its 150th anniversary.

European Steel Production

European steel production declined slightly during the first three quarters of 1958, according to the quarterly *Bulletin* of steel statistics recently published by the Economic Commission for Europe.

In comparison with the corresponding period of 1957, the following percentage falls were recorded :—Britain, 9.6; West Germany, 3.8; Finland, 11.0; Austria, 6.0; Belgium, 3.5; Luxembourg, 4.0; Italy, 6.1, and Sweden, 8.1. Production increased in France, the Saar, Denmark, the Netherlands (by as much as 20.2 per cent.), USSR, Czechoslovakia, and Poland.

Imports of finished steel products into the main importing countries declined in most cases, except for France, the Saar, Italy, and West Germany, where imports exceeded slightly the 1957 level. Exports of Europe's main exporting countries also showed an overall decline, but it is pointed out that 1957 was a record year for world trade in steel.

West German producers of pig-iron have announced that ECSC customers will be offered a rebate for the first quarter of this year of DM 40 (about £3 7s.) per *tonne*. This compares with a former rate of between DM 25 and 30. German producers of ordinary hematite pig-iron and foundry pig-iron have set their rebate for the current period at DM 42.50, special pig-iron with high manganese content has a rebate for the same period of DM 17.50.

It is announced that for the first time "for a very long while" orders placed with West German rolled-steel producers rose last month—by an estimated 150,000 *tonnes*. Home orders are responsible for most of this result, particularly for steel wire, thin plate, and constructional steel.

More Rail-modernization Orders

Orders for diesel locomotives, rolling stock, and electrical equipment worth more than £7,500,000 have been placed with British manufacturers by the British Transport Commission.

Of the 69 main-line diesel locomotives ordered, 49 are to be delivered this year and are to be introduced in areas where steam power is to be entirely replaced. Allocation of the orders is as follows:—20 locomotives of 1,365 h.p. to be built by the Brush Electrical Engineering Company, Limited; 10 locomotives of 2,000 h.p. to be built by the English Electric Company, Limited; 10 locomotives of 800 h.p. to be built by the British Thomson-Houston Company, Limited; and nine locomotives of 1,160 h.p. and 20 of 1,550 h.p. to be built by the Birmingham Railway Carriage & Wagon Company, Limited.

The Metropolitan-Vickers Electrical Company, Limited, is supplying 124 sets of electrical equipment, which will be used in the conversion from d.c. to a.c. of electric trains on the Liverpool Street-Southend services.

Orders for rolling stock include 124 passenger coaches with improved heat and sound insulation, better lighting, and more attractive interiors, and freight vehicles of four special types, designed for carrying extraordinary loads. The orders are distributed between the following manufacturers :—Metropolitan-Cammell Carriage & Wagon Company, Limited; Gloucester Railway Carriage & Wagon Company, Limited; Birmingham Railway Carriage & Wagon Company, Limited; Standard Railway Wagon Company, Limited; Tees Side Bridge & Engineering Works, Limited; and the Cambrian Wagon & Engineering Company, Limited.

This is not an Advertisement !

Allied's Window-display Competition

These pictures are not reproduced here with any intention of advertising products of any one particular firm, but solely as a guide to show what certain iron-founders are prepared to do towards improving the display of their products, and particularly vitreous-enamelled castings, in shop windows. The displays photographed are the result of a competition recently organized by Allied Ironfounders, Limited, to assist in raising the standard display of their goods. There were nearly 300 entries, and earlier this month at the Kensington Palace Hotel, London, Mr. G. Savile Steven, managing director of the company, presented £1,000 in prize-money to the winners of the Window Display Competition. The first prize of £500 was awarded to Thomas Danks & Company, Limited, Nottingham, the second, of £200, to F. T. Ruston & Sons, Limited, Huntingdon, and the third to G. R. Cooper (Oxford), Limited. Twenty prizes of £10 each were also awarded.

A noticeable improvement has been evident during the last few years in window dressing in general, and whilst it may be true that founders' goods do not lend themselves easily to display, it is obvious from the accompanying pictures that a little time and thought can result in a display attractive enough to "catch the eye" of the public. This is just one avenue through which manufacturers of finished goods incorporating castings can help to popularize the products of the foundry.

E.

Book Reviews

Using Steel Wisely, by L. Aitchison and W. I. Pumphrey. Published by Macdonald & Evans, 8, John Street, London, W.C.1; price 44s.

This book is an interesting and welcome contribution from the pens of two well-known metallurgists; it is something in the nature of a sequel to their previous book, "Engineering Steels." The theme around which this book is written is that there is no such thing as a perfectly flawless piece of industrial metal. The book is divided into two parts, Part I, entitled "Creating a Component," being a concise, but precise survey of the fundamentals of manufacturing and treatment processes which are primarily responsible for the genesis of the specific characteristics of any specimen of steel. In Part I—within the compass of 168 pages—there are 12 chapters dealing respectively with shaping a component, ingots, shaping by hot deformation, defects in hot-worked steels, shaping by cold deformation, heat-treatment, the engineering value of hardened and tempered steel, hardenability, surface hardening, limits for impurities and engineering shaping. This constitutes an admirable summary, but the reviewer must express disappointment in reading on page 78 *et seq* of β-iron. With respect it is suggested that this may cause confusion in the minds of some readers who may regard β-iron as an allotrope. Would not the term "non-magnetic α-iron" be preferable?

Part II, extending over 56 pages, is entitled "Making the Best of It" and contains nine chapters with titles as follows:—Factors and formulæ, metallurgical components of the factor of ignorance, internal stress-raisers, general indicators of quality, using the indicators, avoiding the factor of ignorance, choosing a suitable steel, heterogeneity, and inspection. This part of the book is chiefly directed towards the quantitative as well as qualitative assessment of the properties of steels. The book concludes with a glossary of metallurgical terms. There are numerous illustrations, including some excellent photomicrographs.

"Using Steel Wisely" is a noteworthy contribution to the literature and should be of great value, particularly to engineers and designers; it can be recommended without reserve.

J. E. GARSIDE.

Metallurgical Thermochemistry (3rd edition—revised), by O. Kubaschewski and E. Ll. Evans. Published by the Pergamon Press, Limited, 4 and 5, Fitzroy Square, London, W.1; price 63s. net.

Can it be that the appearance of three editions of this book in seven years is evidence of the popularity of the new look in process metallurgy? One suspects that it is the research worker in metallurgical chemistry who is creating the greater part of the demand, though the jacket states that the book was also intended for the process metallurgist who wishes to apply thermodynamical data to the solution of practical problems. To this extent, three new examples of the treatment of such problems have been added to the previous edition. One on the refining of iron reflects current interest in vacuum melting and indicates what goes on inside the furnace. Another is a demonstration of how to appreciate available information on the properties of silicon monoxide. With it goes a footnote offering "apologies to all the authors whose interpretations of experimental results are brusquely treated in this section." This is perhaps evidence of the dynamical approach of the writers of the book themselves, yet with it must have gone a great deal of patience to amass such a wealth of information in 426 pages.

H. O'NEILL.

Publications Received

Buyer's Guide to Fuel Oil, by A. C. Dunningham, D.SC. Published by the Purchasing Officers Association, Wardrobe Court; 146a, Queen Victoria Street, London, E.C.4; price 3s. 6d., post free.

The latest in the series of "Buyer's Guides" reprinted from *The Purchasing Journal* covers fuel oils and deals with their present and probable future position in relation to other sources of energy, detailing grades, analyses, and specifications. The chapter on delivery and storage has some useful information on economical ordering of quantities and storage facilities, together with a map of price-zones and a pence-per-therm comparison with coal. The booklet also covers figures for the world's regional production, consumption, and reserves, and shows the gradually diminishing difference between the costs of coal and oil over the last 30 years.

Test Code for Acoustical Measurement of Centrifugal, Axial and Propeller Fans. Published by Keith Blackman, Limited, Mill Mead Road, Tottenham, London, N.17.

There being no authoritative test code for the sound rating of fans and blowers, Keith Blackman have devized their own. To do so they have established an acoustic research laboratory, and details of this and the methods used in it are fully set out in this ten-page booklet. Acoustics is a science but little understood by the average technologist and, whilst the publication under review has no pretensions to being a textbook on the subject, it does disclose a system of testing which gives comparative results. The data so gained will materially aid designers to reduce noise in the installations of the future.

House Organs

Saunders Magazine, Christmas 1958. Issued by Saunders Valve Company, Limited, Cwmbran, Mon.

This magazine is obviously handled by an experienced Editor who understands layout, the use of type and the English language. It is the type of magazine which is acceptable alike to staff and the firm's agents. One of the most interesting events reported comes under the heading of Goulds Foundries, Limited. It tells of a course of four lectures, devoted to the design of castings, being held in the works for junior draughtsmen from the Northern Aluminium Company, Limited. The reviewer considers this type of collaboration is underrated when it is so modestly described in the magazine as "bound to be useful."

Die-casting News, No. 1. Published by the Zinc Alloy Die Casters Association, 34 Berkeley Square, London, W.1.

This is an eight-page bulletin which is being distributed free of charge by the Association. Using a limited amount of colour, it describes and illustrates some of the new applications of die-castings. The value of the *Bulletin* is not in detailing those applications for which the dies have already been made, but rather the interest it creates in the general potentialities of the die-casting process.

Ruston Review. No. 2. Issued by Ruston & Hornsby, Limited, Lincoln.

The world-wide business effected by this great engineering concern is well reflected in this issue of the *Review*. A "stop-press announcement" of a £250,000 order for Egypt is of particular interest, as heralding a new era in Middle East business.

Company News

BARROW HÆMATITE STEEL COMPANY, LIMITED—The company has received a further conditional offer of 5s. 6d. per 5s. ordinary share. The offer was made by Close Bros. Intimation of an offer of 5s. per share was announced last month. Full acceptance for the £353,625 ordinary capital would cost about £389,000. The directors recommend acceptance and propose to do so in respect of their own holdings.

MANN, EGERTON & COMPANY, LIMITED, electrical and automobile engineers, etc., of Norwich—The dividend is effectively raised to 20 (17½) per cent., and an unchanged final of 13¼ per cent. for the year ended September 30, 1958, is accompanied by a special 2½ per cent. interim for 1958-59, which, it is stated, will not be taken into account when considering dividends for that year. Net profit is £92,263 (£97,457).

ENGLISH ELECTRIC COMPANY, LIMITED—Applications for the £6,000,000 5½ per cent. debenture stock, 1979-84, offered to debenture, preference, and ordinary stockholders at £97 per cent., exceeded £100,000,000. All applicants will receive an allotment on the approximate basis of 5½ per cent. with a minimum of £100 stock. The rights offer of 1,826,606 ordinary shares at 50s. each to ordinary stockholders closed on Tuesday.

H. M. HOBSON, LIMITED, manufacturers of aircraft engine components, of Wolverhampton—A special interim of 5 per cent. is announced on account of 1958-59. This is in addition to effectively maintaining the dividend at 7½ per cent. on a doubled capital of £1,600,000 for the year ended September 30, 1958. Group profits stand at £892,482 (£849,895), but heavier tax and depreciation provisions reduce the net balance to £379,168 (£373,623).

AUSTIN HOY & COMPANY (HOLDINGS), LIMITED, mining machinery manufacturers, of Saunderton, High Wycombe (Bucks)—A one-for-three capitalization issue is to be made, but the board emphasizes that the increase in the ordinary share capital in no way presages any increase in the total distribution. Group net profits declined to £74,156 (£92,926) and, with an unchanged final of 17½ per cent., the ordinary dividend is maintained at 25 per cent.

KITCHEN & WADE, LIMITED, manufacturers of drilling, boring, and honing machines, of Halifax—The directors have given careful consideration to the amended offer for the company's share capital by the Asquith Machine Tool Corporation, Limited, and do not feel able to recommend acceptance. The offer has now been sent direct to holders and the directors will communicate with the holders as soon as they have been able to consider the circular.

CENTRAL WAGON COMPANY, LIMITED—The directors state that trading in the past six months has been "most difficult." The British Transport Commission decided not to proceed with its programme for conversion of rolling stock to vacuum brakes. The decision was reached after the company had incurred heavy expenditure on special shops and plant and also on the manufacture and storage of parts. If the company's contract is not honoured it will have a heavy claim on the BTC. Negotiations are now proceeding with the BTC regarding the commission's restriction on repairs. Group net profit was reduced to £155,232 (£224,293) for the year to September 30, 1958, and the dividend on the £750,000 one-class capital is held at 15 per cent., with an unchanged 10 per cent. final.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

801,309. Société D'Electro-Chimie, D'Electro-Métallurgie et des Acieries Electriques D'Ugine, 10 Rue du Général Foy, Paris, 8, France.

Production of steel ingots, in particular of solid ingots in which pipe is eliminated or reduced to a very small value. See also B.P. 789,657 and 789,792,, FOUNDRY TRADE JOURNAL, March 27, 1958.)

802,134. T. J. R. Bright, "The Lodge," Leek Wootton, Warwick.

The production of ceramic high-temperature resisting moulds. The invention's main advantage is that the ceramic mould is re-usable. A co-patent, 802,135, gives a method and apparatus for producing an accurately-dimensioned pattern which may be used in conjunction with the moulds described in 802,134.

802,256. Elecktro-Thermit, G.m.b.H., 125, Gerlingstrasse, Essen, Germany.

A method of re-surfacing worn and abraded sections, exfoliations, and other similar defects in bull-headed railway-track members. Basically, the method is to cut away to the defective part, and to surround the part with a mould. The required steel is produced aluminothermically *in situ* and cast on to the base which has been preheated.

802,299. F.A.I.M., s.r.l., Via Majocchi, 8, Milan, Italy.

Improved composition for making moulds and cores, having such cohesion and hardness that the moulds or cores can be re-employed many times without having to be re-made.

802,790. American Cast Iron Pipe Company, Birmingham, Alabama, USA.

Apparatus for stripping or removing tubular metal castings from the moulds in which they are formed, and for cleaning such castings after removal. This invention is particularly concerned with mechanisms for stripping and cleaning hollow castings made by the centrifugal-casting process disclosed in Patent No. 717,515.

803,053. General Tire and Rubber Company, 1708, Englewood Avenue, Akron, Summit, Ohio, USA.

Polymethacrolein reaction product. The ammonium and amine salts of polypropenyl methacrylate serve as a binder for sand cores and moulds. Heating the salts in contact with sand or other siliceous materials bonds the particles together by means of the very heat-stable polyactones derived from the salts, and forms rigid and strong cores and moulds.

Recent Wills

TENNANT, COL. JAMES, former works manager of British Insulated Callender's Cables, Limited, Prescot (Lancs) £67,595

MASON, C. C., former joint managing director of the Cambridge Instrument Company, Limited, London, S.W.1 ... ... £126,142

CURNOW, M. H., formerly managing director of Rudge, Littley, Limited, iron and non-ferrous foundrymen, of West Bromwich (Staffs) ... £2,824

CARTLAND, JOHN, late director and works manager of Fry's Metal Foundries, Limited, London, S.W.19, and of the Eyre Smelting Company, Limited, Doncaster, vice-president of the Institute of Metals, 1947 ... ... £71,591

BONNY, CMNDR. A. D., deputy chief designer (future projects) at the Parsons Marine Turbine Research Station, Wallsend, formerly for four years Professor of Marine Engineering at the Royal Naval College, Greenwich £13,297

News in Brief

THE ADDRESS of the London office of Prat-Daniels (Stroud), Limited, is now 62/3, Fenchurch Street, London, E.C.3 (telephone: ROYAL 4122/6305).

NINE EMPLOYEES of A. J. Riley & Son, Limited, boilermakers, Victoria Works, Batley, Yorkshire, have each received a gold watch on completing 25 years' service. The presentations were made on January 16, by Mr. Norman Shaw, chairman of the company.

A NEW FIRM, R. F. Fraser-Smith, with premises at 69, King's Cross Road, London, W.C.1, has been set up principally for the manufacture and supply of industrial radiographic equipment and accessories: a particular manufacture is Gamma-ray equipment of a new design.

WITHIN A WEEK of receiving a £250,000 order for road tankers from the National Iranian Oil Company, Leyland Motors, Limited, has gained another order from Iran, valued at nearly £80,000. The latest order is for 40 Leyland Comet dump-trucks for road-construction work.

J. & J. GILHAM, LIMITED, ironfounders, Trafalgar Foundry, Leeds: Deighton's Patent Flue and Tube Company, Limited, Vulcan Works, Leeds; and Waterhouse Bros. (Steel Erectors), Limited, Albion Mills, Pudsey, have been elected members of the Leeds Chamber of Commerce.

LEY'S MALLEABLE CASTINGS COMPANY, LIMITED, of Derby, have awarded a contract worth £120,000 to Birlec, Limited, of Birmingham, to supply additional electric furnace equipment for Ley's new mechanized foundry at Derby. The equipment will be used in the annealing of pearlitic-malleable-iron castings.

HUNSLET ENGINE COMPANY, LIMITED, has received an order worth £500 000 from the British Transport Commission for 33 diesel shunting locomotives of 204 h.p. They are 32-ton 0-6-0 locomotives and are to be delivered this year and next. It is the biggest order the firm has received from British Railways.

CLEVELAND BRIDGE & ENGINEERING COMPANY, LIMITED, Darlington, is carrying out a contract for the reconstruction of the decks of Bridges D.124 and D.124B., which carry the district line over the East London line at Whitechapel Station. The cost of the work, to be carried out in three months, is £15,500.

AN APPLICATION by the Machine Tool Trades Association is being considered by the Board of Trade for a reduction in the rate of import duty on machine tools and for ending exemption of particular importations by duty free directions under Section 6 of the Import Duties Act, 1958. A duty cut from 17½ per cent. to 10 per cent. is being advocated by the Association.

BRIGHTSIDE FOUNDRY & ENGINEERING COMPANY, LIMITED, Sheffield, report that the major engineering contract for a semi-continuous copper-rod mill for a firm of British cable makers and embodying many new design features to ensure high-quality rod, is nearing completion. The plant is expected to start production during the early part of the year.

WITHIN THE NEXT FEW DAYS some 12,000 employees of Leyland Motors, Limited, Lancs., will be deciding the venue for the company's annual men's outing to take place later this year. As in previous years they will receive ballot papers in their wage packets, and this year they are to be given the choice of going to either Ostend, the Isle of Man, Dublin or London.

EDGAR ALLEN TRACKWORK DEPARTMENT has recently finished the layout on the east side of Liverpool Street Station, Eastern Region, British Railways, in high-manganese steel. The switches are built up from rolled rail and the cast manganese crossings are to the latest British Railways design. The company has now received a further contract for supplying similar work on the west side.

THE INTERNATIONAL PLASTICS EXHIBITION is to be held in the Grand and National Halls, Olympia, London, from June 17 to 27, and in view of the heavy demand for space the organizers have decided to extend the machinery section into the Empire Hall. The attendance figure of 90,000 recorded when the exhibition was held in July, 1957, is expected to be exceeded this year.

ALL PRODUCTION of the cooker-manufacturing firm of Aga Heat, Limited, has now been transferred from Smethwick to the works at Ketley, near Wellington, Salop, 30 miles away. The factory in Mafeking Road, Smethwick, where work has been done for the past 20 years, is now closed in accordance with the policy of concentrating activity at the main works for more economic production and better service.

RUSTON & HORNSBY, LIMITED, Lincoln, have secured an order worth £350.000 to supply the Basrah Petroleum Company, Limited, with industrial gas turbines for pumping oil in the Rumaila area of Iraq. The Basrah Petroleum Company already has four of these engines, which are a development of the jet-aircraft engine. In December the Lincoln company secured a £250,000 order from Egypt for diesel engines and pumps.

BAKER & BESSEMER, LIMITED, dismissed 18 men from their Rotherham works on January 15 after consultation with their unions. The wheel and axle departments have recently been transferred to the company's premises at Kilnhurst and most of the men have already taken up work there. Many of those given notice on January 15 are over 65 and will receive compensation. The foundry at the Rotherham works will remain open for some time.

B. P. EXPLORATION COMPANY has discovered oil a mile-and-a-half east of Gainsborough, Lincolnshire, on the Corringham Road. A test-well struck oil at 4,600 ft. and has produced 15 tons a day during tests. It is about two-and-a-half miles west of Corringham where oil was found last July. The company is now preparing to delimit the Corringham field and the field at Bothamsall, Nottinghamshire, where it found oil earlier last year.

THE FIRST CONSIGNMENT from a contract for eight roll housings, each weighing 96 tons, for use in a new four-stand tandem rolling mill at Port Talbot, made by the Davy & United Engineering Company, Limited, Darnall, Sheffield, arrived at Port Talbot on January 18. It left Darnall on January 11 and travelled on 100-ton capacity wagons, at a speed of 25 m.p.h. The second consignment was due to leave Darnall on January 25 and to arrive at Port Talbot on February 1.

THE FRENCH PUBLISHING HOUSE, Editions Techniques des Industries de la Fonderie, 12, Avenue Raphael, Paris, 16, announces that during April they are to publish a book "The Non-destructive Control of Materials by Gamma-radiography," by A. Blondel of the *Centre Technique des Industries de la Fonderie*. It is stated to be the first of its kind published in Europe. The pre-publication price—that is before March 1—is 3,000 French francs and after that date 3,750 francs.

"ELECTRICITY AND ITS CONTRIBUTION TO THE STANDARD OF LIVING" is to be the theme of the eleventh British Electrical Power convention, to be held in Torquay from June 1 to 5, under the presidency of Mr. C. R. King, C.B.E., deputy chairman, Central

News in Brief

Electricity Generating Board. As in former years, there will be an electrical exhibition associated with the convention. Although the exhibition will not be officially opened by the president until the evening of June 1, it will be open to delegates all day.

RHODESIAN IRON & STEEL COMPANY is to instal, at its works near Que Que, a £700,000 mill to produce sheet and light plate. It will produce sheet from 28 to 10 gauge and plate up to ¼-in. thick, with a capacity of 20,000 tons a year, working on a three-shift basis. The £700 000 expenditure—over £400,000 of which will go on dismantling, transport and assembling costs—will be additional to the £8,000,000 development programme which is aimed at raising RISCO capacity from its present potential of 80,000 tons a year to 150,000 tons by the early 1960s.

SHEFFIELD COLLEGE OF COMMERCE AND TECHNOLOGY commenced their third six-week re-orientation course for ex-members of the Forces on January 14. Thirteen ex-officers, including a brigadier, are attending. Dr. G. Lawson, principal, addressing the men, said they should not expect to emerge from such a course as either managing directors or chairmen of companies, but the knowledge gained would be of great value in applications for industrial posts. Colonel M. W. Batchelor said industrialists were warming to the scheme and letters to employers had had some excellent results.

A SERIES OF TEN WEEKLY MEETINGS on "Production Control" have been arranged by the British Institute of Management, in collaboration with the Institution of Production Engineers, for production managers, general managers and production controllers. Commencing on March 17, these meetings will be held at 2.30 p.m. each week in Management House, Fetter Lane, E.C.4, and at each meeting a new aspect of the subject will be introduced by a leading authority. Full details can be obtained from Mr. A. Green, British Institute of Management, Management House, at the address quoted.

THE APPLICATION of Sheffield Corporation for powers under the Clean Air Act without the intervention of alkali inspectors has now been supported by Mr. R. E. Winterbottom, M.P. for Brightside, Sheffield, in a letter to Mr. Henry Brooke, the Minister of Housing and Local Government. He writes, "In view of the highly-qualified inspectorate under the Sheffield and district authority, the city could be made the central experimental area for control of its own atmosphere under the clean air committee. Sheffield has devoted a great deal of time and experience to this problem and has proved that it is capable."

THE PERMANENT MAGNET BUSINESS previously carried on by English Steel Rolling Mills Corporation, Limited, has been transferred to English Steel Magnet Corporation, Limited, North Street Works, Openshaw, Manchester, which is a newly-formed wholly-owned subsidiary of the parent company, English Steel Corporation, Limited, Sheffield. Chairman of the Magnet Corporation is Mr. R. G. H. Taylor, and Mr. E. J. C. Patrick, formerly manager of the tool steel department, has been appointed director and general manager. Mr. F. S. Beale and Mr. P. Turrell have also been appointed directors, and the new Corporation's secretary is Mr. A. M. Simmers.

A CONTRACT, valued at over £200,000, has been placed with the General Electric Company, Limited, for the supply of two turbo-blowers for the furnaces at the new works of the South Durham Iron and Steel Company, Limited, West Hartlepool. The blowers are similar in design to those being manufactured by the GEC for the Broken Hill Proprietary Company, Australia, and for the ISCON Steelworks at Durgapur, India. Each will have an output range of 80,000 cub. ft. per min. at 25 lb. per sq. in. to 100,000 cub. ft. per min. at 20 lb. per sq. in. The turbines will operate with steam conditions of 185 lb. per sq. in., and 585 deg. F., and a vacuum of 28 in.

THE HOME SECRETARY, Mr. R. A. Butler, and the Minister of Power, Lord Mills, are to be the chief guests at the 323rd Cutlers' Feast at the Cutlers' Hall, Sheffield, on Tuesday, March 17. There will be a special train from King's Cross to Sheffield to bring guests from London and the south. On the morning following the Feast, the principal guests will tour the works of James Neill & Company (Sheffield), Limited, (of which the Master Cutler, Mr. J. Hugh Neill, is deputy chairman and joint managing director), and its principal subsidiary, the Hallamshire Steel Company, Limited. They will afterwards be entertained to luncheon by the Master Cutler and his fellow-directors.

PROFESSOR A. G. QUARRELL, Professor of Metallurgy at Sheffield University, gave his presidential address to the Sheffield Metallurgical Association on January 20, following his induction at the headquarters of the British Iron and Steel Research Association, in Hoyle Street, Sheffield. He said Sheffield must put more effort into technological advances; it must be less willing to follow where others have led the way, less willing to use processes developed by others, and more determined to find new products and processes that would enable it to keep right in the forefront of technological advance. He added that Sheffield should be receiving royalties not paying them on processes developed abroad.

ONE OF THE EXHIBITS in the British Museum, now celebrating its 200th anniversary, is of interest in the story of metals and has a link with the Oldbury firm of Accles and Pollock. Among the valuable collection of minerals bequeathed by Sir Hans Sloane in founding the Museum, was specimen number 60309—a black mineral found in a stream and sent to Sir Hans by John Winthrop, Governor of Connecticut. Eventually the exhibit roused the curiosity of Charles Hatchett who analysed the ore and found that it contained a new element—columbium—and Accles and Pollock were the first to work it. The metal is now used in atomic reactors as seamless tubing for fuel-element sheaths able to withstand molten sodium.

AT THE ANNUAL DINNER in Birmingham, on January 16, of the West Midlands branch of the Institute of Export, Sir Charles Fitton, president of the Institute, warned British exporters to watch prices closely. World demands were likely to rise he said, but Britain might price herself out of world markets if prices rose sharply upwards. He stressed that particular watch was needed on the prices of iron and steel products, and added that prices should be lowered wherever possible in the export field, at the moment. Sir Anthony Bowlby, a vice-president of the Institute, said that world competition was becoming keener. Nevertheless British exports last year, although showing a slight decline compared with 1957 figures, still reached a value of £3,208,000,000. He congratulated the motor-car industry, and the British Motor Corporation in particular, for an amazing performance in exports to North America. Total exports to that country last year rose in value from £244,000,000 to £273,000,000. Sir Anthony also paid tribute to the valuable contribution in exports made by the aircraft industry.

Personal

Mr. ALASDAIR K. CRAIGHEAD, C.A., has been appointed secretary of Allied Ironfounders, Limited.

Mr. A. O. R. JOHNSON, managing director of T. H. & J. Daniels, Limited, has joined the board of Prat-Daniels (Stroud), Limited.

Mr. P. T. THOMPSON-WALKER has been appointed London manager of Stothert & Pitt, Limited, engineers and ironfounders, of Bath.

Mr. WILLIAM B. BROADBENT, who joined Birfield Industries, Limited, last October, has been appointed assistant director of the railway division.

Mr. N. M. CLARK has been appointed chief engineer of Power Jets (Research and Development), Limited, London, W.1, in succession to Mr. J. HODGE, who has joined the Holman group of companies.

Mr. H. W. GRIFFITHS, honorary secretary of the West Riding of Yorkshire branch of the Institute of British Foundrymen has changed his address to "Bev-Lea" 5 Briarfield Close, Idle, Bradford.

Colonel W. R. GLOVER has retired as chairman and from the board of Glover & Main, Limited. He is honorary president of the company. The new chairman will be appointed in a few weeks.

Mr. A. H. CATTON, managing director of Catton & Company, Limited, engineers, Leeds, has been appointed by the Minister of Power to be a part-time member of the North-Eastern Gas Board from May 1.

Mr. JAMES GARDNER, the former secretary of the Amalgamated Union of Foundry Workers, was presented, by the Kidderminster branch, with a Wilton carpet at a dinner at which Mr. Gardner was the chief guest.

Mr. R. B. BOYLE, sales manager (lawnmower section) at Qualcast, Limited, engineers and lawnmower manufacturers, of Derby, has been appointed chairman, of the Derby branch of the United Commercial Travellers' Association.

Mr. F. A. LEATHERS and Professor F. S. SPRING have been appointed directors of Laporte Industries, Limited. Mr. W. J. PIGGOTT will retire from the board on March 31, on grounds of ill-health, after 52 years of continuous service.

General Electric Company, Limited, announces the following appointments at its Erith works:—Works superintendent, Mr. S. W. HYDE; works manager, Mr. F. J. BEESLEY; production manager and assistant works manager, Mr. W. E. J. REES.

Mr. J. A. HAYWARD, who, since 1946 has been serving the Firth Cleveland group as a director of overseas companies in South Africa, West Indies, USA and Canada, has now in addition been appointed to the board of Firth Cleveland, Limited.

Mr. A. J. GRAY, B.SC., has been appointed general works manager of Ferranti, Limited, Hollinwood (Lancs), in succession to Mr. W. HUNT. Mr. Gray joined the company in 1935, and was appointed works manager of the transformer department in 1946.

Mr. REGINALD C. PEARSE has been appointed an additional director and president of Canadian Vickers, Limited. He will be visiting the establishments of the Vickers group in the UK during the next few months. He will take up his duties as president on May 1.

Professor A. G. QUARRELL, president of the Sheffield and district section of the Junior Institution of Engineers, presented a silver medal and certificate to Mr. F. E. CLARKE on January 12, for the best paper read to the Sheffield section last year by a member.

Mr. CEDRIC OTTEWELL has been elected a director of John Smith & Company (Derby), Limited, brass and aluminium founders, Cotton Lane Foundry, Derby. He will continue as London manager of George Salter & Company, Limited, spring-balance manufacturers, West Bromwich.

Metropolitan-Vickers Electrical Company, Limited, announce the appointment as from January 1, of Mr. H. WEST, ASSOC.M.C.T., HON.M.SC. (MANCHESTER), M.I.MECH.E., as assistant managing director. Mr. West ceases to act as director of electrical engineering from the same date.

Mr. HERBERT SAVILLE, M.INST.GAS.E., chairman of the Oxley Engineering Company, Limited, gasholder manufacturers and engineers, Leeds, and chairman of Drydenair, Limited, Grimshaw Street Foundry, Preston, has retired from the board of the Oxley company after 25 years as a director.

Mr. THOMAS H. BRIDDON, a design engineer with Davy & United Engineering Company, Limited, Sheffield, who has served with the firm for 53 years, retired on January 23. Mr. N. F. Dowding, director of engineering and sales, made presentations to Mr. Briddon to mark his retirement.

The directors of the General Electric Company, Limited, announce the appointment of two new directors, Mr. S. G. CATTO, a managing director of Morgan Grenfell & Company, Limited, and Mr. R. N. MILLAR, general manager of the company's heavy-engineering and nuclear establishments at Erith.

Mr. G. D'ARCY NASH, who has been in charge of the Melbourne office of the Morgan Crucible Company (Australia) Pty., Limited, has been appointed managing director of the Brazilian subsidiary company of the Morgan Crucible Company, Limited. The Melbourne vacancy is to be filled by Mr. L. V. FRANKLIN.

Sir LEONARD SINCLAIR has been appointed a director of the Valor Company, Limited. Sir Leonard retired as chairman of the Esso Petroleum Company, Limited, in December. Mr. A. W. MOLE, who retired as a managing director and from the board of the Valor Company at the end of last year, has been reappointed a director.

The 1959 Benjamin Franklin Medal of the Royal Society of Arts has been awarded to Mr. HENRY GEORGE NELSON for his work in scientific industrial development. Mr. Nelson, who was 42 on January 2, is the managing director of the English Electric Company, Limited, and son and heir of Sir George Nelson, chairman of the company.

Mr. T. W. COOPER has been appointed chairman of H. Kaufmann, Limited. Mr. H. CLARKE, Mr. S. WEBSTER, Mr. F. G. DAWSON and Mr. K. T. ROBERTS have been appointed directors. Mr. J. F. PERRY, Mr. H. KAUFMANN, Mr. J. E. V. JOBSON and Mr. J. A. DANIELLI have resigned from the board. H. Kaufmann is a subsidiary of Qualcast, Limited.

Mr. P. MACKAY-JAMES, a director and general manager of Blackstone & Company, Limited, a subsidiary of R. A. Lister & Company, Limited, has been appointed to the board of the parent company. Mr. F. E. BLACKSTONE, a director of Blackstone & Company and other subsidiary companies, has also been appointed to the board of R. A. Lister & Company.

The Council of The British Shipbuilding Research Association announces the appointment of Sir VICTOR G. SHEPHEARD as director of research in suc-

cession to the late Dr. S. LIVINGSTON SMITH. This appointment has been made for an interim period until such time as a permanent appointment can be made. Sir Victor retired from his office as Director of Naval Construction, Admiralty, last September.

To mark his 58 years with the firm, a presentation was made to Mr. ANDREW R. BARBOUR, a director of Thomas Allan & Sons, Limited, ironfounders, of Thornaby-on-Tees, on January 23. Mr. Barbour began with the firm as an apprentice in the patternshop and was foreman patternmaker from 1910 until 1916 when he became works manager, a position he held until his retirement in December. He was made a director in 1953 and is still on the board. The presentation was made by Mr. T. N. Robson, director and manager, who said that during Mr. Barbour's long term as works manager there had not been an official strike which lasted more than one day. Those present at the ceremony included Mr. Peter Deas, son of the managing director of Federated Foundries with which Thomas Allan's is associated.

Obituary

Mr. JOHN NAISMITH who for nearly 50 years was associated with A. Baird & Son, Limited, ironfounders' engineers, Hamilton, has died. He was foreman patternmaker for many years, and was works manager when he retired two years ago.

Mr. NATHANIEL ALLAN, former director and works manager of Fullerton, Hodgart & Barclay, Limited, engineers, Paisley, was accidentally gassed in his home recently. He was 81, and retired four years ago after more than 60 years' service with the firm.

Chairman of directors of the Gosforth Foundry Company, Limited, and of William Prestwich & Sons, Limited, Mr. W. CARL PRESTWICH died suddenly at the age of 80 on January 13. He had been chairman of the two companies, founded by his father, since 1928, and his son, Mr. William Prestwich, has also for some time been in the family businesses.

The death is announced of Mr. ERIC L. HEATHCOTE, at 79, senior partner of the Birmingham firm of chartered accountants—Heathcote and Coleman. The firm was very closely associated with the foundry industry as he, personally, was the secretary of the Association of Light Metal Founders, whilst his firm acted in a similar capacity for the Association of Bronze and Brass Founders and the Association of Automobile and Allied High Duty Ironfounders. He was quite active in these capacities until quite recently, and at social functions he was always to be seen moving amongst the guests to do everything possible to ensure their full participation and general well-being. Foundrymen of several generations will mourn his passing.

The death is announced, after a prolonged illness, of Mr. T. A. HAMMERSLEY (64), who was joint managing director of the Marco Conveyor & Engineering Company, Limited. The company is one of a small group of mechanical-handling concerns to interest themselves in mechanized foundry practice. Mr. Hammersley took a great interest in the Foundry Equipment and Supplies Association and presided over its affairs for two years with distinction. He was very active in the Mechanical Handling Engineers' Association, and was chairman of one of the international group committees for standardization. "Tommy," as he was affectionately known, was generally recognized as the man to whom one went instinctively for advice, as his views were invariably and essentially wise and practical.

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We have HOOKER'S goods galore man,
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While I'm in the Store.

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ISI Translations

From amongst the most recently published lists of translations available from the Iron & Steel Institute (4, Grosvenor Gardens, London, S.W.1), the following have been selected as being of interest to founders. The price quoted is that for single copies, postage extra, there being reductions for quantities ordered. Readers writing for translations, or for further information, should mention this JOURNAL when doing so.

1031 WERTHEBACH, P., and H. HOFF: "Influence of Annealing on the Precipitation of Aluminium Nitride and the Mechanical Properties of Non-alloyed Steels." *Stahl u. Eisen*, 1958, May 29, pp. 736-743. (£5 10s.)

1050 ZITTER, H., and H. KRAINER: "Sampling and Determination of Hydrogen in Steel under Works Conditions." *Arch. Eisenhütt.*, 1958, July, pp. 401-410. (£7.)
(Apparatus for the determination of hydrogen. Degassing process in relation to temperature and time. Quenching and storing of the samples. Influence of the height of pouring and of the humidity of the air during sampling. Cast and suction samples.)

1104 UHLITZSCH, H., and G. RADOMSKI: "Use, Manufacture, and Heat-treatment of Alloy Cast Steel Rolls." I—Stresses which arise in the Heat-treatment of Cast Steel Rolls, and their Calculation. II—Materials, Applications, and Casting of Cast Steel Rolls and Various Forms of Heat-treatment. I—*Neue Hütte*, 1957, Nov., pp. 655-664. (£4 10s.) II—*Neue Hütte*, 1958, Jan., pp. 10-20. (£4.)
I—(*Summary:* In the heat-treatment of cast steel rolls, stresses arise, particularly because the cooling rate causes various kinds of cracks during the treatment itself or else may cause premature roll failure in service. This paper aims to provide a basis for the heat-treatment of cast steel rolls, and stress calculations have been brought together and put in a form permitting simple computation. Equations and examples of their use are presented for stress and heat calculations, surface and core temperatures and difference in temperature between core and surface, equilibrium temperature and temperature distribution across the section. A chart of surface and core temperatures in quenching is given and time stress variation and its boundary curves discussed. Finally, examples of four fundamental types of time stress variation are given.)
II—(*Summary:* This part deals with the materials for cast steel rolls, in connection with their use in rolling mills, and the usual kinds of heat-treatment applied to cast steel rolls, depending on their application. Three practical examples are given. This is followed by a description of the casting of steel rolls in sand moulds and ingot moulds, and the effects of casting temperature and time. The reasons for hot-tearing and stress cracking, their nature and appearance, and measures for their avoidance are dealt with in detail. To permit the calculation of the stresses occurring during heat-treatment, mathematical considerations are necessary which were presented in Part I of this work, while in Part III, the planning of a heat-treatment for a cast steel roll on the basis of the theoretical equations will be discussed in detail.)

1110 FOCH, W., *et al.*: "Highly-sensitive Determination of Sulphur and Simultaneous Determination of Carbon and Sulphur with a Conductivity Recorder." *Arch. Eisenhütt.*, 1958, Sept., pp. 543-546. (£3.) (*Contents:* Principles of sulphur determination—absorption solution—course of combustion—calibration and evaluation—combined determination of carbon and sulphur from a single weighing.)

The following translations are among those recently made available by Mr. H. Brutcher, Technical Translations, P.O. Box 157, Altadena, Calif., U.S.A. In order to avoid the inconvenience of securing U.S. dollar exchange, Henry Brutcher has appointed an official agent in Great Britain. (Orders should still be addressed to Mr. Brutcher, but payment may be made in sterling to Miss E. K. Willis, 10, Wentworth Road, London, N.W.11.)

BT 4282 LAKHTIN, YU M., and D. S. PINCHUK: "Nitriding of High-strength Magnesium-treated Cast Iron." *Metallov. Obra. Met.*, 1958, July, pp. 39-42. ($2.75.)

BT 4405 KUZNETSOV, V. D., and A. I. LOSKUTOV: "Effect of Lubricant on Penetration of a Diamond-point Indenter into Ductile Metals." *Fiz. Met.*, 1956 (3), pp. 509-513. ($4.90.)

Mr. Brutcher is also preparing translation of:

BOICHENKO. M. S., *et al.*: "Semi-continuous Casting of Stainless Steel." *Stal'*, 1958, Nov., pp. 983-987.

Translations in course of preparation include:

1171 BERGLUND, T.: "Grain-size Charts for Ferritic and Austenitic Structures." *Jernkontorets Ann.*, 1953 (11), pp. 767-784. (Abstracted in JISI, 1954, Aug., pp. 482-483.) (Translated in response to requests received—Form C 57.)

1172 MULLER, R., and F. HOLLWEGER: "Operational Experience with Oil-fired Pusher-type Furnaces." *Stahl. u. Eisen*, 1958, Nov. 13, pp. 1676-1678.

1177 EBERT, F., and A. WAGNER: "Clearing up 'Random Interferences' as Systematic Phenomena accompanying X-ray-fluorescent-spectroscopic Measurements and how to Avoid Them." *Z. Metallkunde*, 1957, Dec., pp. 646-649.

1180 GUTHMANN, E.: "The Problem of Clean Air, with Special Reference to the Iron and Steel Industry." I—*Radex Rundschau*, 1958, Jan., pp. 3-30. (Abstr. JISI, 1958, Oct., p. 210a.) II—*Radex Rundschau*, 1958, Sept., pp. 253-276. (Included in response to requests received—Form C 58.)

1186 ZINOV'EV, N. V.: "Results of Discussion on Quality of Ingot Moulds." *Stal'*, 1958, Nov., pp. 1046-1055. (Translated in response to requests received—Form C 58.)

1187 ANTONI, H.: "Accidents in the German Iron and Steel Industry in 1957: Comparison with American, British, Japanese, French, and Austrian Iron and Steel Industry." *Stahl u. Eisen*, 1958, Dec. 25, pp. 1891-1898.

If any reader knows that translations of any of the papers in the last list have already been made, it would be appreciated if he would inform the Editor of this JOURNAL.

Technical Manuals

This week, on the evening of the 26th, the FOUNDRY TRADE JOURNAL'S representative was present at a party given by the directors of the Technical Press, Limited, at the Arts Club, Dover Street, W.1. The party was to celebrate the publication of the first five parts of their new technical-training manual of the fundamentals of electricity and electronics (entitled "Basic Electricity"). Representatives of the Admiralty, War Office and Air Ministry, together with the military advisers to the High Commissioners of five nations of the Commonwealth, were amongst those present.

The course was devised for the US navy, who have trained more than 50,000 technicians with its aid, and it has been adapted to British and Commonwealth usage and terminology. A further six parts of the course (entitled "Basic Electronics") will be published in the Spring. "Basic Electricity" has obviously been carefully planned, and is brilliantly simplified, carrying at least one clear diagram or cartoon-type illustration on every page. In the writer's opinion this layout is a significant improvement on the usual style, and will give the student a sense of achievement as he finishes each separate part, in his progress through the course.

BR "Business Travel Seasons"

British Railways announce that a business travel season ticket is now available to any firm or undertaking which makes a direct payment of £2,500 a year to British Railways in rail merchandise charges. The qualifying amount was hitherto £5,000 a year. The tickets which can be used over a route or group of routes covering not less than 100 miles, cost about 25 per cent. less than an ordinary season ticket over the same routes. First and second class tickets are obtainable, available from three to 12 months. They are issued to principals of firms or to representatives fully employed on the firm's business. A further ticket may be purchased against each additional merchandise payment of £2,500 a year by the same firm.

IN CONJUNCTION with Shell-Mex and B.P., an "Oil at Home" exhibition is being held by Pearson Bros. (Nottingham), Limited, at their Long Row showrooms. (The exhibition closes on Saturday, January 31.)

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Raw Material Markets

Iron and Steel

Production of all grades of pig-iron continues to exceed demands and difficulty is found by makers in disposing fully of current makes, resulting in increasing stocks. With about 13 furnaces fewer in production than a year ago, supplies are more than sufficient to satisfy the requirements of the steelworks and the foundries, and to ease their economic position a number of furnaces are keeping outputs down to a level consistent with demands. Consumers' stocks are kept at minimum levels, and buying is confined to immediate requirements. The decreased ingot production by the steelworks continues to restrict the usage of basic pig-iron, deliveries of which could be stepped up appreciably if required.

All the furnaces are well provided with raw materials, both for current consumption and stock requirements. Although imports of iron ore are reduced, current consignments from overseas and arisings from home sources adequately provide the required supplies. Blast-furnace coke is also being received in sufficient quantities.

Although some producers of low-phosphorus iron are not disposing of the quantities they would like to do, the demand for these irons is comparatively heavier and more consistent than for other foundry irons. The engineering and speciality foundries continue to be fairly well employed overall and are taking appreciable tonnages of the low-phosphorus irons, together with hematite and some refined irons. These foundries have now a much wider range of low-phosphorus irons to choose from than was the case some time ago when outputs were inadequate, and at present are able to obtain all the supplies they need in the brands they prefer without difficulty. Hematite makers are also able to satisfy current requirements easily and have tonnages to spare, while refined iron producers would welcome a much larger flow of business.

The difficulties which have faced the light foundries for a long time, due to shortage of work, have not yet been surmounted and most of them continue very moderately employed. With the mechanized plants which many of them have installed, the potential production is much greater than work available can provide. Business from home sources is quiet and much export business is lost to overseas producers owing to the keen competition. Those supplying castings for domestic appliances continue to benefit from the improvement in demands, due to the easing of credit restrictions, but overall a much larger amount of work is required before plants can be fully operative. Many of the jobbing foundries are also quiet, as well as the textile foundries. In consequence, the call for high-phosphorus pig-iron shows no appreciable improvement. Current production is not fully taken up and large stocks are held by the furnaces.

There is little, if any, change in the pattern of business at the re-rollers. The majority of the mills are short of work and continue to operate on a reduced number of shifts. Steel semis are plentiful and home steelworks could increase present deliveries appreciably if demands justified.

Non-ferrous Metals

The flattening out of demand towards the end of last week left the copper market dull, though the undertone remained firm. However, contrary to expectations stocks in LME warehouses declined further last week and now stand at only 4,361 tons. This item of news made for a more favourable sentiment and when the report from Chile came through that the workers at Annaconda's Potrerillos copper mine in Chile will go on strike from February 1 unless their new wage demands are met, buyers again re-entered the market. Coming as it did on a market not too well supplied with metal, the price for cash metal rose sharply to well clear of £230 a ton. With stocks increasing rapidly, it is not surprising that the backwardation has now widened to over £5 a ton.

In America, the future's market is active, but the general price structure has remained unchanged since last week. Custom smelters are still quoting 29½ cents and producers 29 cents a pound. Scrap metal, however, dropped fractionally below 24 cents a pound. The outlook in America is now beginning to come under the influence of the new wages contracts, which fall to be renewed at all the major mining and refining companies on June 30 next. The only other item of information of interest is the news that the Rhodesian Selection Trust group of mines expect that the production for the year ending June 30, 1959, will fall short of their target figure by about 10,000 tons.

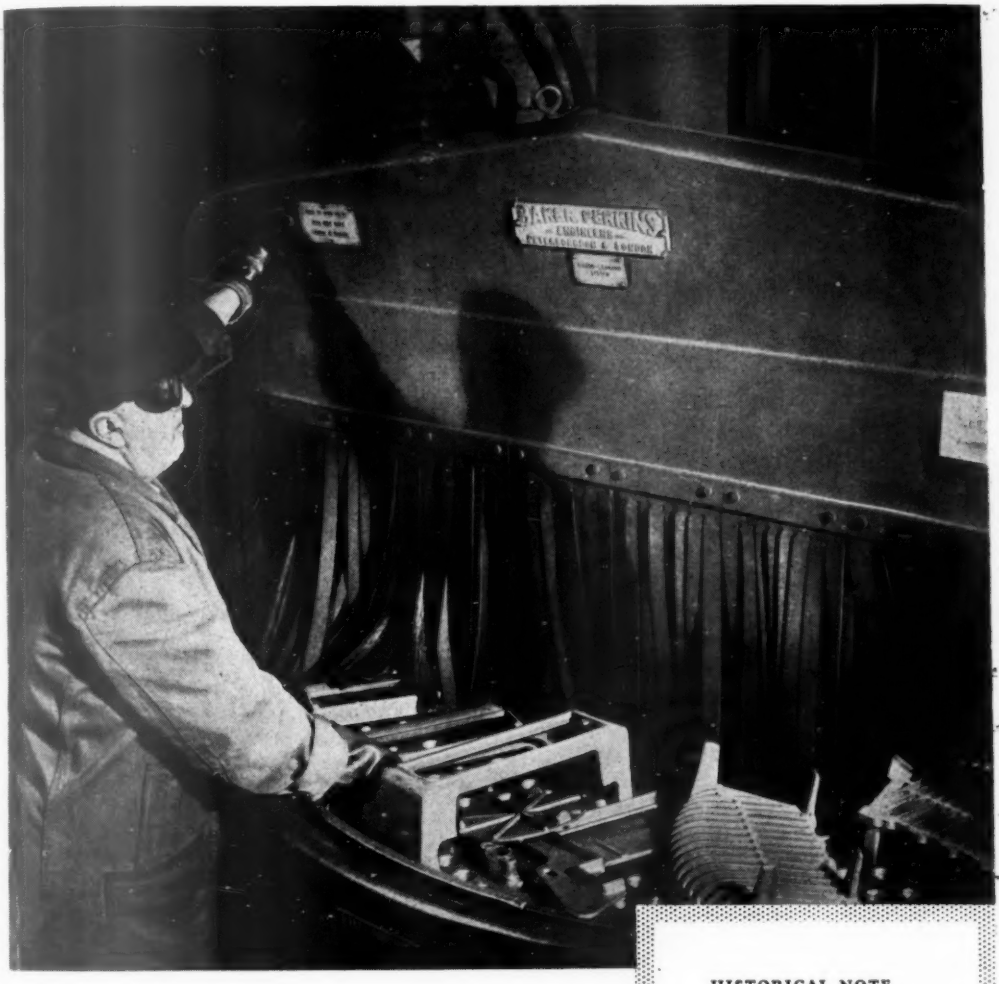
Tin has been quiet, though steady, on both sides of the Atlantic. The feature of this market has been the announcement that Russia has informed the International Tin Council of its intention to consider limiting its tin exports to non-Communist countries in 1959 to 13,500 tons. In view of this conciliatory attitude, the UK Board of Trade has lifted import restrictions on Soviet tin. Holland took this decision last week and it is understood that other countries will now do the same. The point about Russian intentions is that it means a drop of some 6,000 tons from the rate at which they were moving the metal into western Europe last year. On the face of it, this should be good for the tin market, but there is the fear that Russian metal will be diverted to other Communistic countries and will find its way subsequently into western Europe. The market in London continues to hold up well and stocks fell again last week a further 50 tons to 15,075 tons. In the United States, the market is quietly steady, with the price not far below $1 a pound.

Lead came under discussion last week after the US price was reduced by a full 1 cent to 12 cents a pound, New York. The East St. Louis price was adjusted accordingly and now stands at 11.80 cents per pound. The reduction did not affect the London market unduly as the quotation was well below that ruling in America. This is still the position and substantial amounts of the metal have been shipped across the Atlantic to take advantage of the higher prices despite US import quotas. The outlook is still weak, although it is understood that the US Government is considering changing the present arrangements.

Zinc is reasonably active, but the undertone is shaky on fears of a cut in the US price. A minor feature has been a narrowing of the backwardation as supplies of metal from the Continent have become available to the London market. The US price is still unchanged at 11½ cents a pound.

New Zealand Institute of Foundrymen

The New Zealand Institute of Foundrymen was formed on August 9, 1956, with headquarters at Auckland. Later that year, branches were established in Wellington and Christchurch and in 1958 a Dunedin branch was formed. The membership now totals 241, with 105 at Auckland, 42 at Christchurch, 24 at Dunedin and 70 at Wellington. Mr. R. Linn (Auckland) is the president; Mr. K. M. Brown (Dunedin), vice-president and Mr. A. W. Skam, the secretary-general. There is hope of close co-operation or affiliation with the Australian Institute.



Baker Perkins Foundry Machinery at work ... *at Joseph Bloomer & Sons Ltd.*

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HISTORICAL NOTE

Joseph Bloomer & Sons Ltd. were established in 1860. At their Ladysmith Foundry and Chain Works, which are in Cradley, Staffordshire, they produce a wide range of castings for gas and calor gas cookers, agricultural and textile machinery, the motor industry, continuous burning fires and stoves and many other applications.

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

January 28, 1959

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.: N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S.1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 0s. 0d. to £43 10s. 0d., scale 15s. 0d. per unit; 75 per cent. Si, £56 10s. 0d. to £60 10s. 0d., scale 15s. 0d. to 16s. 0d. per unit.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 8s. 3d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 11s. 3d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £77 0s. 0d. to £81 0s. 0d., basis 60 per cent. Cr, scale 26s. 0d. to 27s. 6d. per unit; over 6 per cent. C, £74 10s. 0d. to £77 10s. 0d., basis 60 per cent. Cr, scale 26s. 0d. to 27s. 6d. per unit; 2 per cent. C,* 1s. 7½d. to 1s. 10½d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 0.15 per cent. C,* 1s. 9d. to 2s. 0d. per lb. Cr; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £255 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/72 per cent., Nb + Ta, 19s. 9d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £73 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., £32 15s. 6d.; tested, 0.08 to 0.33 per cent. C, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), £34 17s. 0d.; silico-manganese, £43 16s. 6d.; free-cutting, £36 14s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 2s. 0d.; boiler plates (N.-E. Coast), £44 12s. 0d.; floor plates (N.-E. Coast), £43 11s. 0d.; angles (N.-E. Coast), £39 16s. 6d.; joists (N.-E. Coast), £39 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £40 0s. 6d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, £39 0s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £44 16s. 0d.; black sheets (hand mill), 24g., £58 14s. 6d.; galvanized corrugated sheets, 24g., £67 10s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 11s. 0d.; nickel-chrome-molybdenum, £111 19s. 0d.

NON-FERROUS METALS

Copper.—Cash, £239 10s. 0d. to £240 0s. 0d.; three months, £234 0s. 0d. to £234 10s. 0d.; settlement, £240 0s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 2¾d. per lb.; rods, 244s. 0d. per cwt. basis; 20 s.w.g., 279s. 0d. per cwt.

Tin.—Cash, £764 0s. 0d. to £765 0s. 0d.; three months, £764 0s. 0d to £764 10s 0d; settlement, £765 0s. 0d.

Lead (Refined Pig).—Second half January, £70 17s. 6d. to £71 0s. 0d.; second half April, £71 12s. 6d. to £71 15s. 0d.

Zinc.—Second half January, £73 10s. 0d. to £73 15s. 0d.; second half April, £72 0s. 0d. to £72 5s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £107 15s. 0d.; rolled zinc (boiler plates), all English destinations, £105 10s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £97 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 10d. per lb.; sheets to 10 w.g., 194s. 0d. per cwt.; wire, 2s. 7¾d.; rolled metal, 194s. 0d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £149; B6 (85/15), £205; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £192; HTB2 (58 tons), £177; HTB3 (48 tons), —.

Gunmetal.—BS1400, LG2 (85/5/5/5), £184; LG2 (86/7/5/2), £195; G1 (88/10/2/½), £259; (88/10/2/1), £248.

Phosphor Bronze.—BS1400, PB1 (AID released), £276 per ton.

Leaded Phosphor Bronze.—BS1400, LPB1 (1060), £207 per ton.

Phosphor Bronze Strip, etc.—Strip, 285s. 3d. per cwt.; wire, 4s. 0½d. per lb.; rods, 3s. 3½d.; tubes, 3s. 3½d.; chill cast bars: solids 3s. 3d.; cored 3s. 4d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 9½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 2½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 1½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £74 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £180 0s. 0d.; aluminium bronze (BS1400), AB1, £226; AB2, £241.

* Average 68-70 per cent.

Increases in Capital

BOWMAKER (PLANT), LIMITED, Willenhall, increased by £400,000, in £1 shares, beyond the registered capital of £100,000.

SISKOL MACHINES, LIMITED, London, E.C.2, increased by £75,000, in £1 shares, beyond the registered capital of £75,000.

BOLTON ENGINEERING COMPANY, LIMITED, Farnworth, increased by £175,000, in £1 shares, beyond the registered capital of £25,000.

CONSTANTIN (ENGINEERS), LIMITED, London, S.W.1, increased by £40,000, in £1 shares, beyond the registered capital of £10,000.

PUMP MAINTENANCE, LIMITED, London, W.C.2, increased by £75,000, in £1 ordinary shares, beyond the registered capital of £50,000.

FRY'S DIECASTINGS, LIMITED, London, S.W.19, increased by £200,000, in £1 ordinary shares, beyond the registered capital of £300,000.

EARLSDON ENGINEERING COMPANY, LIMITED, Coventry, increased by £10,500, in £1 ordinary shares, beyond the registered capital of £1,500.

BADER MACHINERY COMPANY, LIMITED, London, W.1, increased by £40,000, in £1 ordinary shares, beyond the registered capital of £10,000.

DARLINGTON ENGINEERING COMPANY (GATESHEAD), LIMITED, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £20,000.

CINCINNATI MILLING MACHINES, LIMITED, Birmingham, increased by £500,000, in £1 ordinary shares, beyond the registered capital of £1,500,000.

RIDGACRE IRON & STEEL WORKS, LIMITED, West Bromwich, increased by £65,000, in £1 ordinary shares, beyond the registered capital of £65,000.

MINING & GENERAL ENGINEERS, LIMITED, Mansfield (Notts), increased by £18,000, in £1 ordinary shares, beyond the registered capital of £2,000.

CONDER ENGINEERING COMPANY (MIDLANDS), LIMITED, Winchester, increased by £10,000, in £1 ordinary shares, beyond the registered capital of £10,000.

SAUNDERS & TAYLOR, LIMITED, heating and ventilating engineers, etc., of Manchester, increased by £20,000, in £1 shares, beyond the registered capital of £30,000.

BURROWS & WAINWRIGHT, LIMITED, tinplate merchants, etc., of Epping (Essex), increased by £18,000, in £1 ordinary shares, beyond the registered capital of £2,000.

E. H. PICKFORD & COMPANY, LIMITED, electrical and mechanical engineers, etc., of Sheffield, increased by £100,000, in £1 shares, beyond the registered capital of £60,000.

LLOYD PASCAL & COMPANY, LIMITED, brass, bronze, and iron founders, etc., of Birmingham, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £25,000.

NICHOLSON & RHODES, LIMITED, iron, steel, and scrap merchants, etc., of Sheffield, increased by £48,000, in 5s. ordinary shares, beyond the registered capital of £2,000.

C. ROBERTS & COMPANY (SHEFFIELD), LIMITED, iron and steel merchants, etc., of Sheffield, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £20,000.

BENFORD, LIMITED, manufacturers of concrete and cement mixing machinery, etc., of Warwick, increased by £70,000, in £1 unclassified shares, beyond the registered capital of £80,000.

R. ALGER & SONS, LIMITED, electrical, heating, and sanitary engineers, etc., of Newport (Mon), increased by £16,000 in £1 ordinary shares, beyond the registered capital of £20,000.

ALLEN WEST & COMPANY, LIMITED, electrical and mechanical engineers, etc., of Brighton, increased by £500,000, in 5s. ordinary shares, beyond the registered capital of £2,500,000.

JOSEPH THOMPSON & COMPANY (LIVERPOOL), LIMITED, machinery, chain, and anchor merchants, etc., of Liverpool, increased by £14,500, in £1 ordinary shares, beyond the registered capital of £1,500.

B. FIDDIAN & SON, LIMITED, spade, shovel, and edge-tool manufacturers, etc., of Stourbridge (Worcs), increased by £10,000 in £1 ordinary shares, beyond the registered capital of £15,000.

Changes of Name

Among companies which have recently changed their names are those listed below. The new titles are given in parentheses.

PRAT-DANIEL (STANMORE), LIMITED, boiler manufacturers, etc., of Whitecroft, Nailsworth, Stroud, Glos (Prat-Daniels (Stroud), Limited).

AUTOLIFTS & ENGINEERING COMPANY, LIMITED, Highfield Works, Highfield Road, Blackburn (Autolifts & Engineering (Holdings), Limited.

MILTON ENGINEERING WORKS (MOORE & SCOTT), LIMITED, West Street, Gravesend, Kent (Milton Engineering Works (Gravesend), Limited).

EVERECT (NORTHERN), LIMITED, constructional engineers, manufacturers of and dealers in steel, steel girders, scaffolding, etc., of 19/23, Wimbledon Bridge, London, S.W.19 (Everect, Limited).

PIG IRON

Low Phosphorus
Refined & Cylinder
Hematite
Malleable
Derbyshire
Northamptonshire
Swedish Charcoal

Ferro Silicon (12-14%)
Alloys & Briquettes
N.F. Metals & Alloys
Limestone
Ganister
Moulding Sand
Refractories

WILLIAM JACKS & Co. LTD.
Winchester House, Old Broad Street
TELEPHONE: LONDON WALL 4770 (8 Lines)
London, E.C.2.

Birmingham, 2.
39, Corporation Street.
MIDLAND 3375/6.

Liverpool, 2.
13, Rumford Street.
CENTRAL: 3538

Glasgow, C.2.
93, Hope Street.
CENTRAL: 9969.

CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Fifteen words for 7/6 (minimum charge) and 4d. per word thereafter. Box Numbers 2/3 extra (including postage of replies). Situations wanted 2d. per word throughout.

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

METALLURGIST requires position. City and Guilds Foundry Technology —Patternmaking. A.M.I.B.F. Cupola control, sand control, metal analysis, sand testing, etc. Box MR445, FOUNDRY TRADE JOURNAL.

PATTERNMAKER in process of moving to Herts seeks position Herts, Essex, North London, where experience and practical ability will gain advancement. Patternmaking all aspects. Foundry practice, die models, machine shop assembly, executive and management. Box PP453, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER desires change. At present in full control all departments of large Jobbing Foundry producing castings up to 40 tons, also mechanised plant. Would consider similar position home or abroad with progressive firm. Iron, steel, non-ferrous. Ability to build foundry to meet any type of specialised production or modernise existing foundry. Thorough practical and technical knowledge of modern foundry practice. Metallurgical, administration, planning, budgetary control, etc. Results guaranteed. M.I.B.F. Box FM448, FOUNDRY TRADE JOURNAL.

EX FOUNDRY MANAGER seeks situation in any organisation as CASTINGS BUYER or INSPECTOR. Life experience in Sand, Die, Shell and CO_2, All Metals. Can carry out complete liaison between Pattern supply and Supplier. Box EF404, FOUNDRY TRADE JOURNAL.

PATTERNMAKER (36), 15 years' foundry experience, seeks post with prospects of advancement. Box PM435, FOUNDRY TRADE JOURNAL.

HOT BRASS PRESSINGS. London Agent is terminating agreement and offers a live and substantial connection to progressive firm with capacity available. Box HR431, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (38), wide experience in cast iron production methods and technology, limited capital, seeks interest in foundry wishing to augment executive working strength. Practical, technically and commercially qualified; will not expect (or accept) offer unless able to assure services will fully meet requirements. Replies treated as confidential. Box FM434, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN, 38, A.M.I.B.F., seeks position in small to medium sized foundry, preferably in country district. Used to full control of Foundry and Fettling shop. Proved record of success. Experienced in Floor, Bench, Machine, CO_2 and Shell Moulding, training of green labour. Grey iron and high temperature metals. Box FF439, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

Foundry Manager

is required for leading Blackheart malleable ironfoundry. Initially will work directly under the Works Manager, but will be required to take full personal responsibility within two or three years. Must have a sound practical experience and a technical background, and preferably near the age range of 30-40. Generous pension scheme. Reply giving a full history of experience and all details of present position to SHOTTON BROS. LIMITED, Manchester Street, Oldbury.

SALES REPRESENTATIVE required for West Midland Foundry producing high duty repetition castings, and jobbing castings up to one ton to grade 26. Must have established connections with automobile and allied trades utilising high duty castings. Full details of experience, age and salary required, and date available. Box SR438, FOUNDRY TRADE JOURNAL.

E. AUSTIN & SONS (LONDON), LTD., require, at their Hertfordshire works, METALLURGICAL CHEMIST competent in analysis of copper base alloys. Knowledge manufacture of these alloys essential. Details of experience, etc., to MANAGING DIRECTOR, Atlas Wharf, London, E.9.

Foundry Foreman

required for Blackheart malleable foundry. Previous experience on mechanised moulding is important and should have already held a supervisory position. The appointment is not for a senior foreman but will offer good prospects to a suitable candidate in the age range 30-40. There is a generous pension scheme. Details of previous experience and present position to SHOTTON BROS. LTD., Manchester Street, Oldbury.

COREMAKING CHARGEHAND wanted for large Aluminium Foundry, Birmingham District. Full knowledge of trade and capable of handling labour. Apply, stating age and experience, to Box CC447, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—contd.

ESTIMATOR and COST CLERK required by West Midland Ironfoundry. Applicant should be able to calculate weights of castings from drawings. Please give details of past experience. Box EA443, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER required for Blackheart Malleable Iron Foundry, Staffordshire Area. Please state age and experience. Excellent prospects for a man wishing to find a post where initiative and drive would be appreciated. Box FM442, FOUNDRY TRADE JOURNAL.

WANTED—REPRESENTATIVE calling on General Engineers in London and South West Areas; to take up agency for Grey Iron and High Duty and Non-ferrous Castings. Box WR454, FOUNDRY TRADE JOURNAL.

FOREMAN required for large Jobbing Foundry situated in the south of England. Castings in grey iron up to 6 tons. Small Non-ferrous Foundry. House available. Application forms on request to Box FR455, FOUNDRY TRADE JOURNAL.

FOUNDRY PLANT and DEVELOPMENT ENGINEER required, for West Midland Foundry. Full experience in mechanical and electrical problems. Give full details, in confidence, of experience, age, salary required and when available. Box FP441, FOUNDRY TRADE JOURNAL.

LABORATORY TECHNICIAN required to take charge of laboratory engaged in the routine analyses of Iron and Steel, also capable of supervising Junior Male Staff. Assistance given with housing if required. Write giving full details of age, experience and references to Box LT444, FOUNDRY TRADE JOURNAL.

MEDIUM Sized Aluminium Gravity Diecasting Foundry in the Manchester area require a practical experienced man to take charge. This is a well-paid permanent situation with excellent opportunities for advancement. Only those capable of obtaining results using their own initiative need apply. Box MS445, FOUNDRY TRADE JOURNAL.

EXPERIENCED MAN wanted to take charge Light Alloy Foundry Department, up-to-date knowledge of latest techniques connected with aluminium sand and die casting essential. State experience and present position in confidence to: MANAGING DIRECTOR, Eclipse Foundry & Engineering Co. Ltd., Sedgley Road West, Tipton.